CISCO

Service Description: Data Center Optimization Services

This document describes the Data Center Optimization Services.

Related Documents: This document should be read in conjunction with the following documents also posted at www.cisco.com/go/servicedescriptions/ : (1) Glossary of Terms; (2) List of Services Not Covered; and (3) Severity and Escalation Guidelines. All capitalized terms in this description have the meaning ascribed to them in the Glossary of Terms.

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This Data Center Optimization Service is intended to supplement a current support agreement for Cisco products and is only available where all Product(s) in Customer's Network is supported through a minimum of core services such as Cisco's SMARTnet and Software Application Services, as applicable. Cisco shall provide the Data Center Optimization Service described below as selected and detailed on the Purchase Order for which Cisco has been paid the appropriate fee. Cisco shall provide a Quote for Services ("Quote"), identifying the various service elements with the corresponding SKU as shown in Appendix A, setting out the extent of the Services and duration that Cisco shall provide such Services. Cisco shall receive a Purchase Order that references the Quote agreed between the parties and that, additionally, acknowledges and agrees to the terms contained therein.

Data Center Optimization Services

Services Summary

Data Center Optimization Service includes service areas of Data Center Architecture and Virtualization, Cloud, Data Virtualization (DV), Desktop Virtualization, Data Center Unified Computing Data Center Unified Networking Services, Data Center Unified Fabric, and Data Center Storage, OpenStack, Application Centric Infrastructure (ACI) and Cloud Onboarding. Data Center Optimization Services provide annual, ongoing support for Customer data center architecture and virtualization, Unified Computing, application network solutions, Storage Area Networking (SAN), and Data Center ("DC") switching, addressing the following:

- DC Layer 4 – Layer 7 (L4/7): all Cisco Content devices: (CSS, GSS, CSM, SSLM, FWSM, ACE, AXG etc.)
- DC Caching devices: all Content Distribution modules (eg. ACNS, eCDS), all Wide Area File Services and Devices (eg. WAE, MDE, vWAAS, ISR, WAVE, etc.)
- DC Server Networking: Unified Computing Systems, UCS Director and Server Virtualization
- DC Nexus Family of Switches (7000, 5000, 3000, 2000, 1000v)
- DC Storage Area Network: all Cisco SAN Switches (eg. MDS 9120/40, 9020, 9506, 9509, 9513 etc.)
- Cisco Information Server (CIS)

Data Center Optimization - General Support

Data Center Improvement Plan
Ongoing Design support
Ongoing Software support
Ongoing Support and Project Management Support
Prepare and Present Quarterly Business Review
Proactive Software Recommendation Report
Remote Knowledge Transfer Sessions
Scheduled Change Support
Test Plan Review
Validation and Test Cycle standard

Data Center Strategy and Architecture Service

Data Center Virtualization Architecture Assessment
Data Center Virtualization Design Review
Application Migration Planning Review
Architecture Value Analysis
Architecture Acceleration Assessment
IPv6 Architecture and Design Review
IPv6 Device Assessment

Security Assessment for Secure Cloud and DC Network Devices
Security Strategy Planning Support for Secure Cloud and DC
Security Assessment for Secure Cloud and DC
Data Center Security Posture Assessment
On Site Residency

Cloud Optimization

Cloud Technology Architecture Assessment
Cloud Management Automation Assessment

Data Virtualization Optimization

Data Virtualization Architecture Review
CIS Site and Systems Administration Support
Data Virtualization Health Check
Data Virtualization Upgrade Assessment/Support
Data Virtualization On Site Residency

Desktop Virtualization Optimization

Desktop Virtualization Systems Assessment
Desktop Virtualization Architecture Review
Desktop Virtualization Operations Audit
Ongoing Desktop Virtualization Design Support

Data Center Unified Computing Optimization

UCS Architecture Assessment
UCS Configuration and Performance Audit
UCS Disaster Recovery Review
UCS Leading Practices Audit
Application Dependency Mapping
Onsite Unified Computing Consulting Support
UCS Health Check
Nexus1000v Health Check
UCS Operational Enhancement Assessment
UCS System Integration Support
UCS SAP HANA Heath Check
UCS Application Workshop

Data Center Unified Networking (ACE, WAAS) Services Optimization

UNS Network Assessment
UNS Architecture Review
Application Security Assessment
CSS/CSM/SSLM to ACE migration report
Ongoing WAAS Mobil support
ACNS to eCDS migration support
WAAS Configuration Audit
WAAS Health Check

Data Center Unified Fabric (Nexus) Optimization

Nexus Network Assessment
Nexus Architecture Review

Nexus Advanced Feature Assessment
Nexus Fiber Channel over Ethernet ("FCoE") Support
Nexus security assessment
Nexus Business Continuance Review
Nexus Advanced Feature Assessment
Nexus Virtualization Design Review
Nexus Health Check
Onsite Nexus Consulting Support (EMEAR and APAC)

SAN Optimization Services

SAN Assessment
SAN Architecture Review
Test Plan Review
SAN Health Check
Storage Capacity & Impact Analysis
Data Migration
FCoE Support
FICON Support
SAN Management & Monitoring
SAN Extension (FCIP, DWDM, IOA)
SAN Assessment Service for Brocade displacement

Cisco Data Center Modular Knowledge Service

Cisco Data Services for Operations Enablement

Operations Audit
Management Solution Architecture Review
Operations Support Planning
Instrumentation Audit
Data Center Resiliency Analysis
Management Software upgrade Support (Minor and Major)
Operational process or runbook update
ITSM Residency

Cisco Data Center Intelligent Automation Services

Upgrade Assessment and Support
Site and Systems Administration Support
Ongoing Support

Cisco Intelligent Automation for Cloud

Upgrade Assessment and Support
Site and Systems Administration Support
Day 2 Custom Workflow Support
Ongoing Support

Cisco Network Operations Automation Services

Workshop
Upgrade Assessment and Support
Site and Systems Administration Support
Ongoing Support
Custom Design Day 2 Reactive Support
Prepare & Present QBR

Cisco Workload Automation Services

Assessment
Upgrade Assessment and Support
Site and Systems Administration Support
Ongoing Support
Custom Design Day 2 Reactive Support

Connected Grid Energy Optimization Service ("EOS")

Discovery and Information Gathering
Energy Management Assessment
Energy Management Support and Knowledge Transfer

Cloud Onboarding Automation Factory

Ongoing Service and Project Management Support
Knowledge Transfer
Usage of Automated Workload Migration Toolset
Ongoing Tool Support
Migration Support
Systems Integration Support

OpenStack Optimization Services

Day 2 Custom Workflow Support

Application Centric Infrastructure (ACI) Optimization Services

Application Centric Infrastructure (ACI) Day 2 Reactive Custom Workflow Support

SAP HANA Optimization

SAP HANA Optimization

Cisco Responsibilities

Cisco shall provide services for the Customer's data center during Standard Business Hours (unless stated otherwise). Cisco shall provide the following General Support provisions across all the activities described below as selected by Customer:

Data Center Optimization - General Support

Designate an engineer ("Advanced Services Engineer") to act as the primary interface with Customer for its data center optimization service delivery.

o Participate in regular visits to the Customer either via phone, email or in-person to review proactive deliverables and activities and to plan for next quarter. In-person visits not to exceed eight (8) days in aggregate. Additional visits will be mutually agreed at Cisco's then-current travel and labor rates.

o Participate in periodic conference calls (usually weekly) to review Customer's data center status, planning and the Services being provided.
o Monitor a Customer-specific Cisco email alias to facilitate communication with primary Advanced Services Engineer as well as the engineers on the Cisco's Data Center team.
o Make collaboration tools available for the purposes of (including but not limited to): hosting meetings, managing documentation, instant messaging, desktop sharing, and collaborative spaces.

The quantity of any reporting and efforts for ongoing activities described herein will vary depending on Customer requirements and what Customer and Cisco mutually agree upon when Services are purchased as identified in the Quote provided by Cisco.

Ongoing Design Support

o Provide informal support for incremental changes to the Data Center or architecture.

Ongoing Software Support

o Provide informal support for incremental changes to device configuration or architecture.

Scheduled Change Support

o Provide a remote resource for critical scheduled changes. Cisco will make available, upon receipt of not less than twenty-one (21) days prior written request to Cisco by Customer, a designated support contact person who will be available to consult with Customer in major Network service changes (i.e. major Hardware upgrade(s), major site installation(s) or major configuration changes). Customer agrees to submit a detailed request and schedule to Cisco prior to any such activity, which may include:
· Collaboration with Customer to evaluate the potential impact of the proposed changes
· review the implementation procedures remote assistance for Customer to resolve problems with Network changes during a major activity to the production Network

Proactive Software Recommendation Report

o Cisco will consult with Customer via a series of meetings to develop a thorough understanding of Customer's Software management requirements and practices such as standards, migration triggers, and implementation methodologies. The Proactive Software Recommendation Report will contain overall strategy recommendations and may include, among other information informal support for incremental changes to device configuration or architecture

o Each report covers a single Software track and may include, among other information, the following:
- Analysis of Customer's current practices related to establishing and managing Software release standards and Software migration triggers
- Analysis of Customer's current practices related Software selection, testing, staging, implementation, and troubleshooting
- Assistance establishing Software track methodologies
- Overall Software recommendation Customer should test and consider
- Descriptions of new Software features
- Unresolved Software bugs to which Customer may be exposed and if possible, appropriate workarounds
- Periodic proactive critical bug analysis for identified Software track(s) or key Network infrastructure Software feature categories
- Periodically updated follow-up reports, at a rate of no more than once per month, for up to 120 days from the original Software recommendation date
- Assistance in defining feature requirements and performance/availability objectives as relates to Software strategy.

Test Plan Review

o Review Customer test plans for thoroughness and effectiveness of planned testing. Plans will be reviewed based on issues and recommendations identified in either the Test Lab Strategy Review, Hosted testing or Network Ready for Use Testing, and Activities.

Ongoing Support and Project Management

o Provide ongoing support and project management to assist with the overall delivery of the Data Center Optimization Service for incremental changes to the Network or architecture.

Data Center Improvement Plan

o Provide a plan that integrates recommendations from the areas of Data Center Assessments (such as Architecture Assessment and configuration audit), Software recommendations and Bug scrub, into a single document. The Data Center Improvement Plan represents the Customer-approved and agreed-upon Cisco recommendations as prioritized by a joint steering committee comprised of Cisco and Customer, and may be used by Customer to track future projects.

o Diagnose overall data center network health to identify, prioritize and track Data Center Nexus/WAAS health impacting issues such as availability, performance, faults and capacity based on specific business and network characteristics.

Prepare and Present Quarterly Business Review

o Schedule with Customer up to four (4) quarterly visits per year (not to exceed eight (8) days in aggregate) to Customer's site to review Deliverables and activities and plan for the next quarter. Additional visits will be mutually agreed upon at Cisco's then-current travel and labor rates (this does not apply to Unified Switching Fabric (Nexus)).

Remote Knowledge Transfer Sessions

o Cisco will consult with Customer to identify requirements and topics for informal training sessions. Remote Knowledge Transfer Sessions are:

- Delivered in English (other languages subject to availability)
- Informal technical updates such as a "chalk talk" on a topic that is mutually agreed upon and relevant to the technologies in the data center.
- Service to be provided by an Advanced Services Engineer or another senior Cisco engineer.
- Delivered remotely for up to four (4) hours in length, with no labs and no printed course materials
- Relevant to the Cisco products and technologies deployed in Customer's production Network

Validation-Test Cycle and Review – Standard

Cisco will consult with Customer via a series of meetings to develop a thorough understanding of Customer's solution testing goals and requirements, and generate a proposed Test Plan. Once agreed, Cisco will execute the tests documented in the Test Plan and report findings to Customer. Validation and Testing Support may include, among other information, the following:

- Review of Customer's testing goals and business objectives for the solution;
- Analysis of requirements such as software strategy, platforms, topology, protocols, and configurations
- Test Plan development or review/refine existing test plan;
- Schedule facilities, equipment and resources;
- Test Set Up – Perform the Physical Lab Setup;
- Test Execution – Execute the Test Plan; and,
- Test Results Analysis – Document the results in a Test Report.
- Validation-Test Cycle and Review - Standard Support is estimated to last between 8 to 12 weeks.
- Validation and Testing Support is only available to certain geographic locations and will be specified in the Quote for Services.

Data Center Strategy and Architecture Service

Data Center Virtualization Architecture Assessment

o   Provide Data Center Architecture Virtualization Assessment. Cisco will consult with Customer via a series of meetings to identify the future architecture requirements for a data center consolidation or data center virtualization. A Data Center Architecture Virtualization Assessment may include, among other information:

- Review of the current data center infrastructure and future Network requirements for consolidation, virtualization, or both
- Review of the technology architecture layers such as facilities, Network, server, and application platforms
- Analysis of technology feasibility
- Analysis of consolidation and/or virtualization impact to application business services domains
- Analysis of server inventory, performance data, and operating system data
- Analysis of potential server consolidation and/or virtualization costs and savings related to server hardware and infrastructure licenses
- Report describing the analysis comparing Customer's current practices to Cisco's recommended best practices and recommendations for server consolidation and/or virtualization
- Report describing analysis of performance, availability, component inventory and/or inter-dependencies of domains and views, service, and data transport, and recommendations
- Report describing opportunities and steps needed for optimization, consolidation, and /or virtualization with recommendations

Data Center Virtualization Design Review

o   Review Customer's infrastructure technologies to analyze and identify virtualization opportunities in the following areas:
- Network (Layer 2/Layer 3 infrastructure)
- Network transport and application call flows
- Security networking (firewall design)
- Server load balancing
- Web caching within the data center
- Secure Sockets Layer (SSL) offload

o   A report of findings and recommendations based on Cisco leading practices and onsite discussions will be presented at Customer quarterly review. Recommendations may include:
- Low-level design for the Layer 2/Layer 3 infrastructure and integrated design
- High- Level design architecture review addressing an end-to-end virtualized architecture covering Network, network services, security, SAN.

These activities are performed a minimum of two times but may be performed up to four times per year for one data center after the Data Center Architecture Assessment has been completed.

Architecture Acceleration Assessment

o   Provides assistance to the Customer in evaluating the compute platform while simultaneously transitioning the environment towards the defined production future state. Activities may include:

- Analyzing the Customers' server and computing platform technical architecture, as it relates to projected environment, resource capacity and user community demands.
- Documenting challenges, critical success factors and risks
- Providing recommendations on infrastructure design
- Review a services framework to develop an architecture roadmap
- Review areas for reduction in complexity and total cost of ownership ("TCO")
- Discussion of areas for increasing architectural flexibility /agility.

Data Center Architecture Value Analysis

o   Cisco will provide a comprehensive financial analysis spanning the server environment, storage environment, and networking environment by analyzing costs and operational commitments

o   The Cisco Data Center Architecture Value Analysis Service includes the following deliverables:

- Financial analysis report
- Capital investments required during the project lifecycle
- Savings in infrastructure, facilities, and energy costs
- Executive and technology presentations

Application Migration Planning Review

o   Gather current application components scheduled for deployment across the server pool considered for virtualization
o   Collaborate with Customer to confirm application component information related to performance, compatibility, patch level, application availability and interdependencies
o   Identify existing and future application service domains
o   Analyze application migration plan considering the following:
- seamless migration of all the IT system environments : production , development , user acceptance test ("UAT") part of the virtualized environment
- minimal to no changes to current Application component configuration and/or implementation
- minimal to no risk due to Application component inter-dependencies
- impact of current IT project related to existing or new IT systems that require services from the virtualized context

- Data Center architectural changes required to support remote application service access.

o Create following Reports with recommendations:

- Application Component Availability Deployment Report
- Application Component Patch Version/Level Compatibility
- Application Component Inter-dependency Views
- Application Component Performance Report
- Application Migration Strategy Document
- IT Project Impact Analysis to the Migration Strategy
- Application Migration Roadmap

Data Center IPv6 Architecture and Design Review

o Provide Data Center IPv6 Architecture Assessment. Cisco will consult with Customer via a series of meetings to identify the current and future IPv6 architecture and Design requirements for a data center. A Data Center IPv6 Architecture and Design Assessment may include, among other information:

- Review of the current data center infrastructure and future Network requirements for IPv6
- Review of existing configurations, feature and design
- Review and plan IPv6 Address Planning for Data Center, DMZ, Internet Edge
- Review and assess IPv6 dependencies like DNS, DHCP requirements
- Recommend code and feature set for IPv6 Design for the Data Center
- Provide high level Architecture and Design guidelines and support IPv6 planning in the Data Center (DMZ, Internet Edge)

Data Center IPv6 Device Assessment

o Provide Data Center IPv6 Device Readiness Assessment. Cisco will work with Customer to gather and install necessary devices in the Network/Data Center to collect device configuration for assessment. A Data Center IPv6 device Assessment may include, among other information:

- Identify pilot and product devices/points in Data center for IPv6 piloting
- Identify devices for configuration collection either via tools or manual
- Assess and analyze configuration and system information
- Review and compile necessary recommendation for IPv6 readiness
- This may include Memory/CPU/Code upgrades
- Recommend configuration changes to enable IPv6 in the Data Center
- Provide report with device assessment and with appropriate recommendations

Security Assessment for Secure Cloud and DC Network Devices

The Security Assessment for Secure Cloud and Data Center Network Devices assesses a Customer's data center device security. This service is focused on understanding the current state of the hardening of the individual data center devices by analyzing their configuration files.

- Cisco will consult with Customer via a series of meetings to understand and analyze aspects of Customer's Data Center and Cloud Network device security. A Device Security Assessment will be performed on up to 350 security devices in the Data Center and may include, among other information, the following:

o Review of Customer's Data Center and cloud device security goals and requirements;
o Analysis of data center device configurations focused on security hardening of the individual devices;
o Analysis of firewall rules for common configuration issues;
o Report describing the analysis comparing Customer's current configuration to Cisco's recommended best practices and Cisco's recommendations (sampled based on size and configuration of network);
o Report describing prioritized list of discovered vulnerabilities and most critical findings; and,
o Interactive presentation of findings, analysis, and recommendations.

Security Assessment for Secure Cloud and DC

The Security Assessment for Secure Cloud and DC evaluates the capabilities of the network infrastructure to protect an identified business critical asset and provide a set of recommendations to remediate the identified security gaps for that business critical asset. The recommendations include improvements to topology, protocols, device configurations and security controls.

The Security Assessment includes one business critical asset and sampling of devices from one each of the following network areas: data center, internal network, and perimeter network.

Further details on the Security Assessment are described in the SDA specific Service Description at www.cisco.com/go/servicedescriptions/, incorporated herein by reference.

Security Strategy Planning Support for Secure Cloud and DC

o Cisco will provide strategic and tactical guidance via a series of meetings or workshop around a Customer selected network security topic. Topics may include but are not limited to network security technologies, cloud, data center security.
o Participate in network Security Strategy and Planning meetings or workshop.

o   Provide collateral / technical reference material (white papers, technical specifications) as requested for specific technologies or for network security architectural approaches.
o   Provide guidance and recommendations for data center network security strategies.
o   Develop a Security Technology Planning Meeting Report, providing a synopsis of the meeting and documenting recommendations.

Data Center Security Posture Assessment

Cisco will consult with Customer via a series of meetings to understand and analyze aspects of internal and perimeter security posture of the Customer's Network. A Data Center Security Posture Assessment (SPA) provides a point-in-time assessment of the risk posed to an organization by vulnerabilities present in the organization's IP-networked systems and security controls. The service measures the extent to which identified vulnerabilities can be utilized to achieve unexpected or unauthorized access to the OS or applications on IP-connected endpoints (UNIX / Windows / network and security devices). The SPA will include the following:
•   Internal Security Posture Assessment
  ·   Critical Network and Asset Identification Workshop,
  ·   Discovery and Vulnerability Identification,
  ·   Vulnerability Confirmation and Target Analysis,
  ·   Results Analysis and Presentation, and,
  ·   Assessment Report.
•   Perimeter Security Posture Assessment
  ·   Discovery and Vulnerability Identification,
  ·   Vulnerability Confirmation and Target Analysis,
  ·   Targeted Phishing Vulnerability Analysis,
  ·   Results Analysis and Presentation, and,
  ·   Assessment Report.

Further details on the Security Posture Assessment are described in the SPA specific Service Description at www.cisco.com/go/servicedescriptions/, incorporated herein by reference**.**

On Site Residency

Cisco On Site Resident provides skilled Data Center professionals to supplement Customer personnel and spends between one and twenty five days a month onsite over a period of three to twelve months, as specified in Quote and Purchase Order, and will perform the following types of tasks:.

·   Provides targeted consulting support as directed by Customer during Customer's normal business hours.After hours support available upon mutual agreement within scope of engagement.
·   Consult with Customer staff to develop an understanding of Customer's Data Center design and implementation, with a focus on concerns such as resiliency, self-recovery, scalability, disaster recovery, business continuance,

virtualization, application traffic requirements, and ability to handle increased traffic demands.
•   Participate in on site meetings and periodic conference calls to review Customer's Network status, planning and the Services being provided
•   Monitor a Customer-specific Cisco email alias to facilitate communication with Cisco designated Services team
•   Resident Network Consulting Engineer may utilize Customer provided data, scripts or internal tools to assist in collecting data from the Network.
•   Provide real-time monitoring and measurement of network fault, performance, capacity and availability events to proactively analyze and identify service-impacting issues
•   Provide real-time notification to Customer of network, storage and compute impacting issues
•   Provides guidance in the following areas
  •   Device/Server Admin Functions
  •   Planning Of Moves, Adds, And Changes
  •   Change Window Support
  •   Basic Design Consulting
  •   Device Configuration
  •   Device Monitoring
  •   Resource Management
  •   Basic Device Troubleshooting
  •   Root-cause Analysis
  •   Technology/Device Knowledge Transfer
  •   Weekly Status Reporting

Cloud Optimization

Cloud Technology Architecture Assessment

The Cloud Technology Architecture Assessment will conduct an architecture and security assessment of the Customer's current data center architecture and plans, providing analysis of current states of the architecture and security and identifying any issues found with the Customer's current technology architecture (Network, storage and compute), as it pertains to a desire to transition to, or evolve further to (in the case of an existing cloud architecture), an architecture capable of offering cloud Infrastructure, DRaaS and software services (XaaS).Activities may include:

·   Gather business and technical requirements related to Customer's cloud data center architecture and security by conducting a combination of on-site discovery workshops and interviews with Customer stakeholders.
·   Conduct an assessment of Customer's current architecture with aim to make recommendations on what is required to refocus the Customer's data center plans to evolve to a cloud technology architecture.
·   Cloud Technology Architecture Assessment Report

The following are **not** in scope of the Cloud Technology Architecture Assessment Service:

·   Wireless technologies;
·   Unified Communications;
·   Application and/or Business services architectural recommendations. These services will be addressed only

from mapping and dependencies to the technology service area perspectives and will help the definition of the network blocks in-line with Customer complete set of requirements;

- Assessment or integration of SLA services into the existing or future state of the technology services;
- Non-operational perspective analysis of the Server and Storage layers;

Cloud Management Automation Assessment

Provides an analysis of the Customer's current management automation tools – specifically orchestration, provisioning tools, management portal and assurance tools - making recommendations for the management tools infrastructure necessary to support a cloud computing architecture capable of offering cloud Infrastructure- as-a-Services (IaaS) and/or DRaaS. In the case of an existing cloud deployment, the recommendations will focus on improvements to meet best practices for management of a cloud architecture; and in the case of a non-cloud deployment, recommendations will focus on changes and new tools necessary to meet the requirements of an existing cloud technology architecture plan.
Cisco Service Activities:

- Conduct a discovery workshop including interviews with Customer to capture and document the Customer's current management automation strategy and toolset, along with associated workflows.
- Assess the Customer's requirements for cloud orchestration management tools, documenting the Customer requirements and recommendations in the Cloud Management Automation Assessment Report.
- Assess the Customer's current performance and SLA monitoring, measurement, management and reporting tools, documenting the Customer's capabilities and requirements for cloud computing, including SLA management and capacity management in the Cloud Management Automation Assessment Report.
- Review with Customer the Cloud Management Automation Assessment Report for comment and approval before it is formally completed and released.
- Cloud Management Automation Assessment Report

Data Virtualization Optimization

Data Virtualization Architecture Review

The Data Virtualization Architecture Review Service provides a comprehensive review of the existing CIS Data Virtualization architecture.

- Review of the overall current Data Virtualization implementation and its ability to support current and future DV needs.
- Review of the DV architecture layers, as appropriate, and provide guidance on retooling the layered DV architecture to conform to best practices

- Assess likelihood Customer can meet performance goals with their current DV structure and provide performance tuning advice on how to improve overall DV performance
- Review existing security implementation and provide recommendations for meeting current and future security requirements
- Assess current and planned front-end tools and applications and make recommendations for optimizing the access of the DV layer from these tools
- Assess current and planned back-end data sources and make recommendations for optimizing the access of the DV layer to these sources

CIS Site and Systems Administration Support

The Site and Systems Administration Support service is designed for site administrators responsible for the configuration, administration and maintenance of the Cisco Information Server (CIS) implementation. It provides expert advice and best practices to ensure day-to-day operations using CIS run smoothly and efficiently, with stable and scalable operations.

Cisco will provide onsite and remote support for the following activities that are generally performed:

- Monitor CIS environment(s):
  - o Perform daily CIS system health check (log files, archive, response time, etc)
  - o Provide proactive notification of errors, degradation, other suspicious or unusual activity to appropriate contacts
  - o Monitor CIS server utilization
    - ▪ Memory
    - ▪ CPU
    - ▪ Local storage
    - ▪ Throughput metrics
  - o Create weekly service level reports

- Maintain CIS environments:
  - o Apply hot fixes, upgrades, etc.
  - o Develop and maintain daily/ weekly/monthly maintenance plans and processes
  - o Perform Server restarts as required
  - o Work with hardware operations for physical server maintenance as scheduled
  - o Maintain security scheme and permissions
  - o Maintain CIS environments according to the direction of the CIS Technical Architect
  - o Inspect settings, software versions, etc.; check for consistency across CIS environments
  - o Build & maintain CIS clusters
  - o Manage processes to update CIS caches
  - o Manage deployment related issues - migrating CIS objects from dev to test to production

- Develop and document operational and system management processes (deployment models, user management, access controls)

Data Virtualization Health Check

The Data Virtualization Health Check Service provides a comprehensive health assessment of the existing CIS Data Virtualization implementation and associated processes.

Review the integration of the CIS Data Virtualization environment with existing data management processes, including DV use case selection, project methodology, and development and testing processes

Conduct an Operational Environment Review of the existing CIS Data Virtualization environment. The Operational Environment Review includes an analysis of i) Customer's current CIS Data Virtualization server and environment configuration; ii) operational aspects such as security, control, sizing, data connector configuration; iii) production target model; and iv) data abstraction best practices.

Conduct a Performance Usage Review. The Performance Usage Review includes an analysis of the current CIS Data Virtualization server: i) capacity, sizing, consumption of data; ii) operational logs and usage patterns; iii) promotion and deployment strategies; iv) caching engine and query optimization; and v) system tuning.

Document the findings in the Health Assessment Report.

Data Virtualization Upgrade Assessment/Support

The Data Virtualization Upgrade Assessment/Support Services will provide assessment and support services to determine the impact and effort associated with upgrading Customer's existing CIS implementation to later versions. Cisco will consult with Customer via a series of meetings to understand and analyze aspects of Customer's current environment.

Upgrade Assessment activities may include:

- Review Customer's existing production functionalities, including standard product configurations, integrations and customizations to determine the actions needed to maintain the existing functionality.
- Review current platform and hardware components to ensure accurate sizing.
- Review new product features, product changes, benefits with Customer describing differences between existing and new application software versions and assess impact on existing configurations including potential fitness for use with Customer's existing implementation.
- Document the applicability, effort and changes associated with utilizing new features and functions that are part of the new software release.
- Review customizations, integrations and assess needed changes to ensure continued compatibility and performance.
- Devise plan documenting findings and recommendation that includes one or more of:

  - o Detailed impact, recommended strategy and estimate the level of effort required to complete the upgrade.
  - o Review of Customer's project staffing capabilities and available resources/skill sets.
  - o Plan and effort to remedy any issues uncovered during review process.
  - o Contingency and rollback plans to restore the software to its original version
  - o Plan and effort to utilize new desired product features.
  - o Interactive presentation of findings, analysis, and recommendations.
  - o Recommend a plan and effort to remedy any issues uncovered during review process.

Upgrade Support activities may include:

- Assist in upgrading to later versions.
- Provide planning and resourcing for third party integration and product customization.
- Establish best practices for planning and running the product upgrade.
- Analyze issues encountered and help categorize them into enhancements, deployment issues, and product defects
- Support Customer during the test execution.
- Support Customer in migrating Test and Production environment.
- Executing on any post-production support activities, as defined during scoping of Upgrade Project.

Data Virtualization On Site Residency

Cisco Data Virtualization On Site Resident provides skilled Data Virtualization professionals to supplement Customer personnel onsite and offsite over a period of three to twelve months, as specified in Quote and Purchase Order, and will perform all of the previously mentioned Data Virtualization services, with a focus on the following types of tasks:.

- Provides targeted consulting support as directed by Customer during Customer's normal business hours. After hours support available upon mutual agreement within scope of engagement.
- Consult with Customer staff to develop an understanding of Customer's Data Virtualization design and implementation, with a focus on concerns such as resiliency, security, scalability, performance, application and data abstraction, and DV project selection.
- Participate in on site meetings and periodic conference calls to review Customer's Data Virtualization status, planning and the Services being provided
- Represent and communicate Customer's Data Virtualization requirements to Cisco product planning
- Augment Customer development teams and provide mentorship of Data Virtualization development and deployment best practices

Desktop Virtualization Optimization

Desktop Virtualization Systems Assessment

Measures key performance and utilization metrics of a Customer's desktop and application environments

- Review current technical environment
- Investigate peak utilization trends of users and desktop applications; identify optimal configuration and architecture to meet these thresholds
- Report with performance optimization recommendations for Users, Desktop Applications and End-point resource utilization
- Helps identify areas for platform improvement through implementation performance and capacity patterns, peak utilization trends, and underutilized assets
- Mitigates risk by identifying the best and worst candidates for virtualization

Desktop Virtualization Systems Architecture Review

Review of current desktop virtualization environment configuration and surrounding infrastructure with recommendations based on leading practices

- Review of Customer's design requirements, priorities, and goals
- Assess and analyze effects of new requirement on existing environment and develop a future deployment roadmap including recommending an architecture for the Desktop Virtualization deployments.
- Assess current disaster recovery process and provide recommendations to optimize disaster recovery capability and procedures for Cisco UCS
- Provide a review of best practices for the Desktop Virtualization environment and discuss areas for increasing architectural resiliency, availability, flexibility, and agility

Desktop Virtualization Operations Audit

Provides a review of best practices for the evolving desktop virtualization environment to support growth, improve productivity, improve business processes, and accelerate change.

- Provide a review of current state of operational best practices and processes for the Desktop Virtualization environment including management and operational tools
- Review operational key performance indicators and provide report describing specific operations recommendations for optimization based on industry leading practices
- Develop customized operational process regarding adherence and/or adoption to recommended leading practices to provide continuous desktop service improvement strategy

Data Center Unified Computing Optimization

Data Center Unified Computing Optimization is targeted to allow Customers to analyze, improve, and optimize their Cisco data center Unified Computing environment while supporting current production environments. The Service is designed to assess the Customer's current Unified Computing environment to identify areas for improvement. This service will provide recommended leading practice deployment strategies, methodologies and configuration based on these findings. In addition, the Data Center Unified Computing Optimization Service will support planning efforts which will mitigate the risks inherent in any change process.

Unified Computing Architecture Assessment

- o Consult with data center staff in a series of workshops and meetings to develop a thorough understanding of Customer's Unified Computing System ("UCS") and UCS Director design requirements. Review current design and provide recommendations with a focus on concerns such as resiliency, availability and scalability. Cisco will also work with Customer to optimize architecture and performance for virtual and physical environments.

- o Provide a detailed report that summarizes recommendations and findings. The Report may include but is not limited to:

- Review of Customer's design requirements, priorities, and goals
- Review areas for reduction in complexity
- Assess and recommend architecture for the Unified Computing deployments.
- Review current initiatives and align with leading practice deployment methodologies and use cases
- Assist in identifying additional opportunities to utilize UCS capabilities
- Analysis of impact of new requirements on existing environment.
- Develop a recommended architecture and future deployment roadmap.

UCS Configuration and Performance Audit

- o Review current configuration of Unified Computing System, and/or UCS Director and surrounding infrastructure. Cisco will examine this information to provide recommendations based on leading practice configuration methodology and technical settings as appropriate. Activities may include but are not limited to:

- Review and analysis of virtual machine, server, Network and storage performance and utilization
- Investigate peak utilization trends and identify optimal configuration and architecture to meet these threshold
- Identify underutilized assets and recommend optimal layout for highest compression ratios for virtual machines

- Develop report on performance optimization recommendations such as system tuning, virtualized I/O, protocol optimization, and server response times.
- Review technical environment that may include: unified I/O, management switch, chassis and cabling configurations for optimum performance.

UCS Disaster Recovery Review

o Provide a review of Customer's disaster recovery capability for the Unified Computing Systems (UCS) configuration. Activities may include but are not limited to:

- Assess current disaster recovery process and provide recommendations to optimize procedures for Unified Computing Systems.
- Review design for application recovery
- Review Network and storage design between primary and secondary sites
- Review UCS failover design and configuration
- Assist and support Customers in disaster recovery testing

Application Dependency Mapping

o Review Customer assets in the data center and the interdependencies. Activities and deliverables may include:

- Analyze Customer business processes that are in scope in order to provide a high-level overview of the business processes, sub-processes and a list of applications that support those business processes.
- Data Collection Tools will be used to perform discovery of the identified servers in the data center environment and the associated software components that are running on those servers.
- Either data from Data Collection Tools or Customer provided data will be used to discover the networking devices within the Customer data center environment and the respective Network configurations. This service component will also map the servers that were discovered in the Server and Software Discovery Service to the Network devices to which the servers are connected.
- An automated Storage Area Networking (SAN) Data Collection Tool will be used to discover the Customer's SAN environment. The goal of this discovery is to identify all Customer SAN devices within the Customer data center environment and their configurations.
- A Network traffic capturing Data Collection Tool will be used to capture the Network traffic using span sessions. The raw data is converted into IP communication flows. These flows are correlated with software and applications discovered as part of Server and Software Discovery services.
- Provide an in-depth analysis of the state of Customer's business applications and application infrastructure dependencies. The analysis is done by comparing Customer's business requirements and expectations for its applications using 'use cases' for business processes and

the findings from discovery and dependency mapping between the business processes and data center applications.

UCS Leading Practices Audit

o Provide a review of leading practices for the Unified Computing environment. An evolving Unified Computing architecture can help support growth, improve productivity, improve business processes, and accelerate change in every aspect of your business

- Review current Customer UCS and/or UCS Director implementation against a list of lab and project- based leading practice configurations.
- Align applicable leading practice deployment configuration options and settings for specific Customer usage.
- Discuss areas for increasing architectural resiliency, availability, flexibility and agility.

Onsite Consultant Support

Provide ongoing, onsite Unified Computing consulting support in the form of a designated engineer ("Advanced Services Engineer") onsite at Customer's designated location to act as the primary interface with Customer, providing general advice and guidance related to Customer's Unified Computing System (UCS), and/or UCS Director, up to five days per week (pending local work restrictions) during Standard Business Hours excluding Cisco holidays, locally recognized country holidays, vacation, and training days. Customer directed tasks to be performed by the Advanced Services Engineer are subject to Cisco approval, which shall not be unreasonably withheld. Onsite Unified Computing Consulting Support is only available to certain geographic locations and will be specified in the Quote for Services.

UCS Health Check

o Review current configuration of Unified Computing System (UCS), and/or UCS Director infrastructure as part of a periodic examination of post deployment, or audited, environments, that require additional examination guided by Customer needs and concerns. UCS Health Checks are structured to service instances within a single data center environment. Periodic activities may include

- Review and analysis of virtual machine, server, Network and storage performance and utilization including management switch, chassis and cabling configurations
- Develop report on the environment as evaluated against best practices and expected server response times, virtualized I/O, and protocol optimization

UCS Application Workshop

- Provides a workshop looking at migration of existing compute environment to UCS leveraging DCAF used for UCS Health Check. The following activities will occur:

  o Leverage Cisco DCAF to discover the compute server foot print in the data center
  o Develop a migration TCO/ROI analysis summary report
  o Conduct 1 day workshop to understand Customer long term goals and identify potential application/software optimization opportunities
  o Review preliminary TCO/ROI analysis report
  o If Customer is interested in moving forward, Cisco will put together an application optimization roadmap

UCS SAP HANA Heath Check

- Review current configuration of SAP HANA components as part of a periodic examination of post deployment, or audited, environments, that require additional examination guided by Customer needs and concerns.

- Provides a healthcheck in relation to SAP HANA, with the following activities:

  o Scheduled quarterly maintenance and upgrade of HANA appliance components.
  o UCS firmware, UCS manager, SUSE OS, Internal Networking, SAP HANA application, storage*
  o Ad hoc security upgrade support for OS and version updates to HANA
  o Operational support and knowledge transfer for HANA appliance
  o Expansion of HANA to additional nodes, chassis and storage

Nexus1000v Health Check

Review current configuration of Nexus1000v component of server infrastructure as part of a periodic examination of post deployment, or audited, environments, that require additional examination guided by Customer needs and concerns. Nexus1000v Health Checks are structured to service instances within a single data center environment.

o Periodic activities may include

- **Verify operational state of system**
- Review and analysis of vCenter setup, Virtual Ethernet Modules (VEM), SVS connection, etc
- Physical state of port connectivity for VEMs

- **Verify Port Profiles**
- Review and analysis of Uplink Profile, Vethernet Profiles and Overall Usage

- **Access and Monitoring**
- Users, SNMP, Syslog, etc

o Develop report on the environment as evaluated against best practices

UCS Operational Enhancement Assessment

o Review and standardize efficient operational process while working with Unified Computing System (UCS) and/or UCS Director architectures
- Work with Customer to modify existing operations guides to leverage more efficient UCS Manager and Unified Architecture related processes
- Provide recommended best practices to operate a UCS environment to increase agility, availability and operational efficiency.
- Provide Documentation Support and Operations Synopsis Report

UCS System Integration Support

o Review best practices and use cases around the Unified Computing Architecture and surrounding ecosystem that can accelerate completion of an enterprise's automation initiatives within a single data center environment. Periodic activities may include:

- **Automate**
- Review and analysis of compute provisioning, network, storage and applications
- Performance capacity management
- User management

- **Integrate**
- Review and Build workflows between 2 APIs (ie Compute and Hypervisor)
- Scale by adding additional APIs (ie network, storage, security)
- Extend to peripherals and applications

- **Monitor**
- Life Cycle Management
- Performance Capacity Management
- Chargeback / Billing

Data Center Unified Networking Services (ACE, WAAS, eCDS) Optimization

Covers Application Distribution (ACE, L4-7), Unified Switching Fabric (Nexus), Application Network Performance (WAAS, ACNS,eCDS) Components

ACE / L4-7 Assessment

o Once per year, Cisco will provide Customer with an product-based data center architecture assessment to facilitate proper changes in the existing environment, which may include:

• Assess current environment to support planned changes, and identify gaps in the adoption of a Cisco DC technology through current assessment of the design and future goals via subject matter experts and application of leading practices to Cisco design principles.

• A detailed technical assessment of Customer-specific DC technology infrastructure design. Designs for ANS, SAN, and Nexus, Unified Computing families of products are available.

• Proactive recommendation to improve the performance, resiliency, security, and availability of Customer's Cisco DC technical Infrastructure.

ACE / L4-7 Architecture Review

o Consult with Customer networking staff in a series of meetings to develop a thorough understanding of Customer's Data Center design requirements. Technology areas include Application Networking Systems, Unified Computing Systems (UCS), UCS Director, Storage Area Networking, and Unified Switching Fabric, with a focus on concerns such as resiliency, self-recovery, scalability, disaster recovery, business continuance, virtualization, application traffic requirements.

o Provide a detailed design report with recommendations. Report takes into consideration, among other things, the following:

• Review of Customer's design requirements, priorities, and goals.
• Analysis of impact of new requirements on existing Network.
• Architecture and topology for the Network including L4/7 topology, caching, and storage infrastructures.
• Review of protocol selection and configuration.
• Review of feature selection and configuration.
• Review of device security considerations (i.e. authentication, VLANs, subnet isolations, etc.)
• Report describing the new or current design with recommendations.

WAAS Assessment

Once per year, Cisco will provide Customer with a product-based data center architecture assessment to facilitate proper changes in the existing environment, which may include:

• Assess current environment to support planned changes, and identify gaps in the adoption of a Cisco DC technology through current assessment of the design and future goals via subject matter experts and application of leading practices to Cisco design principles.
• A detailed technical assessment of Customer-specific DC technology infrastructure design. Designs for ANS, SAN, and Nexus, Unified Computing families of products are available.
• Proactive recommendation to improve the performance, resiliency, security, and availability of Customer's Cisco DC technical Infrastructure

WAAS Architecture Review

Review of current L4-7 content and application distribution environment configuration and surrounding infrastructure with recommendations based on leading practices.

• Review of Customer's design requirements, priorities, and goals
• Assess and analyze effects of new requirement on existing environment and develop a future deployment roadmap including recommending an architecture for the Desktop Virtualization deployments.
• Assess current disaster recovery process and provide recommendations to optimize disaster recovery capability and procedures for Cisco Unified Networking Services products
• Provide a review of best practices for the Desktop Virtualization environment and discuss areas for increasing architectural resiliency, availability, flexibility, and agility

CSS/CSM/SSLM to ACE Migration Report

Consult with data center staff in a series of interviews and meetings to develop a thorough understanding of the migration requirements.   AS will provide an assessment of the requirements to do a CSS/CSM/SSLM to ACE migration.
Service activities may include:
• Review the current SLB configs to be migrated
• Review the new SLB design
• Determine the recommended method of migration
• Provide SLB knowledge Transfer

This service does not cover the planning, design or implementation of new SLB devices (ACE or ACE 30), only the assessment of the migration readiness and strategy.

Application Security Assessment

Consult with data center staff in understanding the application security requirements related to the server load balancing (SLB) solution in place. AS will conduct a SLB security assessment based on the stated requirements and identify gaps in the security features and configuration deployed with the SLB solution. Activities may include:

- Provide an assessment report which summarizes SLB application security recommendations and findings
- Review of Customer's SLB Applications Security design requirements, priorities, and goals
- Assess current Application SLB design and configurations deployed
- Identify gaps in the current deployment based on the stated Application Security requirements
- Provide possible high level SLB solutions to close gaps
- Provide assessment report documenting findings

This assessment is focused on application security designs tied to the functionality provided thorough the deployed Cisco SLB solutions.

ACNS to eCDS Migration Report

Consult with data center staff in a series of interviews and meetings to develop a thorough understanding of the ACNS to eCDS migration requirements. AS will provide an assessment of the requirements to do a ACNS to eCDS migration. Activities may include:

- Review the current ACNS design and configuration to be migrated
- Review the new purposed eCDS design
- Determine the recommended method of migration
- Provide eCDS knowledge transfer

WAAS Mobile Design Support

Provide informal support for incremental changes to WAAS Mobile configuration or architecture. Consult with Customer on ongoing WAAS Mobile requirements changes, new features, and the associated effects on the existing Network design. Activities may include:

- Review proposed Customer WAN optimization requirements for mobile workforce
- Assess the current WAAS Mobile environment to determine adherence to best practices
- Verify the sizing of the design is keeping up with current and proposed demand
- Validate the software code versions, related to WAAS Mobile, are appropriate for the current and short term environment
- Provide a knowledge transfer around WAAS Mobile

WAAS Configuration Audit
Provide a review of leading practices for the WAAS environment. Verifies that the WAAS devices are configured optimally. Activities may include:

- Review current Customer WAAS implementation against a list of lab and project- based leading practice configurations.

- Align applicable leading practice deployment configuration options and settings for specific Customer usage.
- Discuss areas for increasing architectural resiliency, availability, flexibility and agility

WAAS Health Check

o Review Customer WAAS environment, collecting performance-related data, and applying Cisco leading practices, as part of a periodic examination of post deployment, or audited, environments guided by Customer needs and concerns.

- Collect performance data, identify exception areas, analyze device configurations and resource utilization parameters
- Develop Stability Analysis and Recommendations report which typically includes summaries of the following network-level information: Software, Hardware, Memory, Environment, Protocol Analysis and Network Management

Data Center Unified Fabric (Nexus) Optimization
Covers Application Distribution (ACE, L4-7), Unified Switching Fabric (Nexus), Application Network Performance (WAAS, ACNS) Components

Nexus Network Assessment

Once per year, Cisco will provide Customer with a product-based data center architecture assessment to facilitate proper changes in the existing environment, which may include:

- Assess current environment to support planned changes, and identify gaps in the adoption of a Cisco DC technology through current assessment of the design and future goals via subject matter experts and application of leading practices to Cisco design principles.
- A detailed technical assessment of Customer-specific DC technology infrastructure design. Designs for ANS, SAN, and Nexus, Unified Computing families of products are available.
- Proactive recommendation to improve the performance, resiliency, security, and availability of Customer's Cisco DC technical Infrastructure.

Nexus Architecture Review
Review of current Nexus environment configuration and surrounding infrastructure with recommendations based on leading practices.

- Review of Customer's design requirements, priorities, and goals
- Assess and analyze effects of new requirement on existing environment and develop a future deployment roadmap including recommending an architecture for the Unified Fabric deployments
- Assess current disaster recovery process and provide recommendations to optimize disaster recovery capability and procedures for Cisco Nexus hardware products

- Provide a review of best practices for the unified fabric environment and discuss areas for increasing architectural resiliency, availability, flexibility, and agility

Nexus Advanced Feature Assessment

Consult with data center staff in a series of trainings and meetings to develop a thorough Customer understanding of one Nexus Advanced Feature. (VPC, VDC, Fabric Path, or OTV) Review current Nexus design and provide recommendations with a focus on potential ways of leveraging the targeted available Nexus Advanced Feature in areas such as virtualization, resiliency, availability and scalability. Cisco will also work with Customer to develop a migration strategy to roll out the target Nexus feature into the existing Nexus environment. Activities may include:

o Provide the following services around the targeted Nexus Advanced Feature:

- Provide remote training on target Nexus advanced feature

- Review existing Nexus design to determine readiness and design requirements to deploy targeted Nexus advanced feature

- Provide recommended migration strategy to deploy targeted Nexus Advanced feature

- Provide recommended implementation plan to deploy targeted Nexus Advanced feature

This service includes the design, implementation planning, and training around a single Nexus Advanced feature that the client will deploy. Client can elect the quantity of this service based on the number of features that need to be deployed during contract.

Nexus FCoE Support

Consult with data center staff in a series of trainings and meetings to develop a thorough Customer understanding of the clients FCOE deployment. Service activities may include:

- Provide FCOE design consultation for Moves, adds or changes
- Provide ongoing configuration support of FCOE solution
- Provide new feature support for FCOE solution
- Provide FCOE knowledge Transfer
- Provide FCOE deployment assessment
- Provide design support for any problem escalations on the FCOE solution

This service does not cover the planning, design or implementation of a new deployment of FCOE, only the optimization and "day 2" support of a deployed FCOE solution

Nexus Security Assessment

Consult with data center staff in a series of meeting to understand the Nexus network security requirements and assess the current or purposed design for compliance with the stated security requirements. Activities may include:

- Provide a Nexus Security analysis and report which summarizes any recommendations and findings. The Report will include:

- Review of Clients Nexus Security design requirements, priorities, and goals

- Review current or purposed Nexus Security design and configurations

- Review current initiatives and align with leading practice Network security methodologies and use cases

- Assess and recommend design or configuration changes to Nexus security architecture

This Nexus Security assessment will be focused on Nexus switch/port security and will not include an assessment or recommendations related to application security or FW rules or policies.

Nexus Business Continuance Review

Consult with Customer through a series of meetings to develop a thorough understanding of Customer's Data Center Disaster Recovery design requirements as it applies to Unified Fabric Architecture with a focus on concerns such as resiliency, self-recovery, scalability, disaster recovery, and availability requirements.

- Provide a Disaster Recovery ("DR") review report with high-level best practice design recommendations. Report takes into consideration, among other things, the following:

- Review of Customer's DR design requirements, priorities, and goals.

- Review current DR design and indicate any gaps based on stated requirements

- Propose some best practice recommendations to current design to fill gaps

- Analysis of impact of new DC requirements on existing Network.

- Report describing the possible new or current design based on BC/DB recommendations.

Review is high-Level focused in DR supporting Network architecture and does not include such topics as operations, application specific recommendations or detailed design recommendations.

Nexus Health Check

o Review your Data Center Nexus family switches, collecting performance-related data, current state configurations and applying Cisco leading practices, as part of a periodic examination of post deployment, or audited, environments guided by Customer needs and concerns. Nexus Health Checks are structured to service instances within a single data center environment. Periodic activities may include

- Collect performance data, identify exception areas, analyze device configurations and resource utilization parameters

- Develop Stability Analysis and Recommendations report which typically includes summaries of the following network-level information: Software, Hardware, Memory, Environment, Protocol Analysis and Network Management

- Review report on the environment as evaluated against best practices

Nexus Onsite Consultant Support

Provide on-going, onsite consulting support in the form of a designated engineer ("Advanced Services Engineer") onsite at Customer's designated location to provide Nexus Subject Matter Expertise. This consulting role compliments expertise and activities already provided and available as part of other Cisco Advanced Services. This service provides a Cisco consultant presence, with specialist Nexus knowledge, on-site as part of the Customer's team to participate in and advise.

A Quarterly Business Review is conducted to plan how best to use Nexus Onsite Consultant Support in the following quarter and review how effective the support has been in the previous quarter.

Onsite Consultant Support is available up to five days per week (pending local work restrictions) during Standard Business Hours excluding Cisco holidays, locally recognized country holidays, vacation, and training days. Any Customer directed tasks to be performed by the Advanced Services Engineer are subject to Cisco approval, which shall not be unreasonably withheld. Onsite Nexus Consulting Support is only available to certain geographic locations and will be specified in the Quote for Services.

SAN Optimization Services

SAN Assessment

Once per year, Cisco will provide Customer with a product-based data center architecture assessment to facilitate proper changes in the existing environment, which may include:

- Assess current environment to support planned changes, and identify gaps in the adoption of a Cisco DC technology through current assessment of the design and future goals via subject matter experts and application of leading practices to Cisco design principles.

- A detailed technical assessment of Customer-specific DC technology infrastructure design. Designs for ANS, SAN, and Nexus, Unified Computing families of products are available.

- Proactive recommendation to improve the performance, resiliency, security, and availability of Customer's d DC technical Infrastructure

o Provide informal support for incremental changes to device configuration or architecture

o Provide informal support for incremental changes to the Data Center or architecture.

SAN Architecture Review

Review of current MDS SAN environment configuration and surrounding infrastructure with recommendations based on leading practices

- Review of Customer's design requirements, priorities, and goals
- Assess and analyze effects of new requirement on existing environment and develop a future deployment roadmap including recommending an architecture for Unified Fabric deployments.
- Assess current disaster recovery process and provide recommendations to optimize disaster recovery capability and procedures for Cisco MDS hardware products

Provide a review of best practices for the SAN environment and discuss areas for increasing architectural resiliency, availability, flexibility, and agility

Test Plan Review

o Review Customer provided test plans for thoroughness and effectiveness of planned testing.
- Provide test plan templates
- Analysis of requirements such as platforms, topology, protocols, and configurations
- Report describing test plan findings and recommendation changes

SAN Health Check

o Cisco will provide an analysis of the features and abilities of the MDS platform for optimal deployment and configuration:
- Review of existing SAN infrastructure for adherence to best practices, configuration issues, and architectural bottlenecks
- Recommend new features and configuration updates to ease day-to-day SAN operational requirements
o Cisco will provide a SAN Health Check Report that includes an executive summary, current status of environment, Customer requirements analysis, findings and conclusions.

Storage Capacity & Impact Analysis

- o Cisco will provide an analysis of the Customer's storage array infrastructure to for optimal deployment and configuration:
- Storage capacity utilization
- Allocated but unused storage
- Current storage process maturity
- o Cisco will provide a Prioritized Action Plan highlighting those areas within the storage array infrastructure requiring immediate remediation.
- o A Reference Architecture will be provided highlighting capacity and growth options for the array infrastructure based upon industry best practices. This will include a High Level Plan and ROI Analysis
- o The findings will be presented via an Impact Analysis Executive Summary Presentation.

Data Migration

- o Cisco will consult with Customer via a series of meetings to develop a thorough understanding of Customer's data migration requirements.
- o Perform a SAN and Storage discovery of the Customer's environment using the following methods:
- Data Center Analytics Framework (DCAF) to discover SAN, storage array, network, and host specific information
- Storage array specific collection and management tools
- SAN specific collection tools
- o Working with application owners and system administrators, determine application dependency mapping (ADM).
- o For long-distance data center migration of data, determine SAN extension requirements to support migration
- o Based on the discovery and review with Customer, determine the data migration method(s) best suited for migrating the environment which could include but not limited to:
- Data Mobility Manager (DMM). Cisco fabric-based data migration tool
- Storage array-based migration: Array-vendor specific migration tool (i.e., SRDF, TrueCopy, GlobalMirror, etc.)
- Host-based tools. vmWare Storage vMotion, host operating system LVM mirroring techniques.
- Tape backup and restores
- Other host based methods such as rsync.
- o Create migration Move Groups
- Identify the number of migration windows
- Amount of storage per migration window
- Application and host to move in move group
- o Setup the migration environment:
- Target storage environment configuration and setup
- SAN configuration changes to support replication
- Kick off data replication in advance of migration window (async replication)
- o Support migration window activities
- Final data sync between old and new storage array
- Host cutover to new storage
- Application testing on new storage

- o Clean-up legacy storage environment after successful data migration

FCoE Support

- o Using leading practices, the Cisco FCoE Support Service identifies gaps in the Customer's FCoE infrastructure and provides:
- o FCoE Assessment
- Provides a list of recommendations based on analysis of Customer's environment and comparison against best practices.
- o FCoE Ongoing design support
- Provides detailed design reports on data center architecture components
- Provides recommendations for resiliency, self-recovery, scalability, disaster recovery, business continuance, virtualization, and application traffic requirements
- Provides detailed design reports on FCoE environments
- o Software strategy support
- Ongoing software support for incremental changes to device configuration or architecture
- o Proactive Software Recommendation Report
- Review provides strategic and tactical approach to managing current and future software levels
- Assists in defining feature requirements and performance and availability objectives as they relate to software strategy
- Comprehensive reports for each software track
- Reports examine production configurations and compare them to Cisco's leading practice recommendations
- Recommendations for software modifications as necessary
- o Scheduled change support.
- Ongoing support for incremental changes to the FCoE environment

FICON Support

- o Consult with the Customer to document their FICON requirements such as Control Unit, Channel and CUP requirements.
- o Document the requirements in a Customer Requirements Document
- o Provide a High Level Design documenting the architecture and features to support the Customer's FICON requirements
- o Provide a Low Level FICON Design document that documents the individual feature and switch configurations such as interfaces, VSANs, IPL files, and fabric binding.
- o Provide Knowledge Transfer as to the operation of a FICON enabled MDS infrastructure.

SAN Management & Monitoring

o Document the Customer's SAN alerting and monitoring requirements, Cisco platform alerting features, and Customer's enterprise integration needs.

o Provide a detailed design report with recommended monitoring architecture and best-practice alerting configurations.

• Assist Customer in the implementation of Cisco SAN alerting features and functionality.

• Provide guidance and reference material to assist Customer with integration of alerting to third party network management system platforms.

• Consult with the Customer to determine appropriate event criticality and triage.

o Provide ongoing support

• Design optimization to meet the Customer's changing alerting needs

• Assist the Customer in testing and tuning the alerting thresholds.

• Software upgrade impact analysis

SAN Extension (FCIP, DWDM, IOA)

o Consult with the Customer and document SAN extension drivers such as business continuity, disaster recovery and data mobility.

o Assess underlying network for SAN extension readiness. Identify any gaps and recommendation remediation to support the Customer's SAN extension needs.

o Provide a detailed design report documenting the SAN extension configurations, such as physical and logical topology, addressing, interface and switch configurations.

• Assist the Customer in planning and implementation of advanced SAN extension technologies such as Cisco IO Accelerator.

• Consult with the Customer on best-practice SAN management solutions for Cisco SAN Extension topologies.

o Provide ongoing design optimization as the Customer's needs change and detailed software upgrade impact analysis for Cisco SAN Extension technologies.

• Assist in tuning the performance parameters specific to the Customer's SAN extension requirements and unique environment.

SAN Assessment Service for Brocade SANs

o Conduct a SAN Assessment of the current Brocade SAN to identify current practices and recommend changes within the SAN environment, which may include:

• Review of existing SAN infrastructure for adherence to best practices, configuration issues, and architectural bottlenecks

• Take in account both the architectural and the operational requirements while designing the new MDS based infrastructure.

• Provide alternate SAN Architectural Proposal (Architecture blue print) using Cisco MDS and/or Nexus platforms.

Cisco Data Center Modular Knowledge Service (MKS)

The Cisco Data Center Modular Knowledge Service ("MKS") provides Customer with access to design tips, methodologies, leading practices, and foundational concepts related to Cisco products and technologies. The Content in the library is made available by Cisco to a number of Authorized Viewers through a secure web-based portal ("Portal").

Access to the foundational Network Infrastructure Modular Knowledge Service is provided with each subscription to the Data Center Modular Knowledge Service at no additional charge.

• Make the Content available, remotely, to the number of Authorized Viewers, including providing access to the following:

• **Multimedia Clips:**

• - VoD/AoD technical talks

• -Service deliverables archive – Customer-specific/account specific content

• - eLearning courses

• **Sidebar Content:**

• - White Papers

• - Case Studies

• - Design Guides

• - Configuration Guides

• - Training Documents

• - Technical Tips

• - Deployment Guides

• - Online textbooks and/or manuals

• - Video and audio clips (different from the Multimedia Clips)

• Assist in account creation for the Portal, prior to use during the duration of the Service. Customer is responsible for security, network connection, IP address assignment and any required firewall or access control list changes required on Customer's network in order for the end-users to access the Portal.

• Provide a training session to Customer point(s) of contact for the Authorized Viewers.

• Hold a "Demo Day" to train and demonstrate the tool for Customer's Authorized Viewers.

• Host Content and provide preventative maintenance in accordance with Cisco's normal maintenance schedules and procedures.

- Analyze issues submitted to Cisco through provided e-mail alias tkl-support@cisco.com.

- Provide technical assistance to Customer as Cisco may deem necessary to properly provide the Services.

- **Updated Content:** Cisco may revise, update and/or remove previously-released Multimedia Clips and/or Sidebar Content ("Updated Content"). Cisco will make any Updated Content available to Customer as a part of the Services. The Updated Content will exclude the previously-released Multimedia Clips and Sidebar Content (where applicable) that the Updated Content was intended to supersede. Customer should discontinue any use of the superseded Multimedia Clips and/or Sidebar Content.

Cisco Data Center Services for Operations Enablement

Operations Audit
o A review of current operations processes to provide recommendations to optimize operation of Cisco technology (network, storage and compute) to maximize IT Service availability.
- Kick off meeting to review service deliverable and methodology with key Customer stakeholders
- Schedule and conduct onsite interviews
- Review and analyze Customer provided documentation
- Presentation and review describing findings, together with recommendations for changes to operations processes that will optimize the operation of Cisco technology to maximize IT service availability

Management Solution Architecture

o Review current toolset to provide recommendations to optimize visibility and control of a virtualized data center environment. Takes a holistic view across all management tools used across the data center architecture. Areas of focus may include Event, Incident, Problem, Knowledge, Service Asset & Configuration, Change, IT Service Catalog, Performance and Capacity Management, Automation / Orchestration and Billing & Chargeback
- Create a holistic view of the current IT services management toolset, and operational requirements
- Analyze existing toolset's capability to meet operational requirements
- Presentation and review describing findings, together with a roadmap for recommended changes to the toolset that will optimize the visibility and control of the data center environment

Operations Support Plan

o Determine how best to prepare to operate/manage new Cisco technologies being introduced into the data center environment. Activities and deliverables may include:

- Collaborative onsite and remote Cisco-led, cross-functional team workshops
- Identification of operational requirements
- Organization structure diagrams
- Roles & responsibilities matrix
- Skills matrix
- Workflow diagrams
- Supporting process documentation
- Review of recommendations

Instrumentation Audit

o Maximize operations visibility of Cisco devices in the data center infrastructure by reviewing instrumentation related configuration and how instrumentation features are being used. Provide recommendations and leading practices to maximize operations visibility into the environment.
- Analyze device management feature configurations
- Ascertain via meetings / interviews / documentation the instrumentation collection options deployed in the environment
- Presentation and review describing findings, together with recommendations to further improve operational visibility into the environment.

Resiliency Analysis

o Provide resiliency analysis across the whole data center architecture (holistic view). Uses output from individual network, storage and compute health checks and other services.
- Collect and analyze relevant configuration information using a variety of collection and analysis tools
- Document findings and identify possible risks to infrastructure resiliency that may impact IT service availability
- Produce Resiliency Improvement Roadmap report

Minor Software Upgrade Support

o Current state review and implementation plan to apply minor release update to existing operations product toolset as well as support for the operations toolset
- Validate upgrade path for product(s)
- Document upgrade plan for Customer
- Collaboration with Customer to evaluate the potential impact of the proposed changes
- Review implementation procedures and provide remote assistance for Customer to resolve problems during release updates

Major Software Upgrade Support

o Current state review and implementation plan to execute major release upgrade to existing operations product toolset including upgrade support. Includes upgrade testing as appropriate.
- Validate upgrade path for product(s)

- Document upgrade plan for Customer
- Collaboration with Customer to evaluate the potential impact of the proposed changes
- Test upgrade / backup-restore function(s) as required
- Review the implementation procedures
- Provide remote assistance for Customer to resolve problems with changes during a release update
- Recommend a test plan for the upgraded tools before they are rolled into the production environment

Operational Process or Runbook Update

o Assistance in development / documenting operational run-book(s) or standard operating procedure(s) that addresses a specific operational or technical procedure for a given device / technology / IT service

- Define operational function(s) and technology(ies) for which run-book(s) or standard operating procedure(s) will be produced
- Document procedure(s) and/or process(es) for use in Customer environment
- Deliver and review run-book(s) or standard operating procedure(s with Customer

ITSM Residency

- An on-site resident Cisco IT Service Management (ITSM) Subject Matter Expert Consultant will be provided to supplement Customer personnel and to perform tasks, which may include:

  o Provides targeted consulting support as directed by Customer during Customer's normal business hours. After hours support available upon mutual agreement within scope of engagement
  o Consult with Customer staff to develop an understanding of Customer's ITSM process and tools design and implementation, with a focus on concerns in focus areas such as change management, release & deployment management, transition planning & support, service & validation testing, knowledge management, incident management, problem management and continual service improvement.
  o Participate in on-site meetings and periodic conference calls to review Customer's ITSM status, planning and the IT Services being provided.
  o Monitor a Customer-specific Cisco email alias to facilitate communication with Cisco designated Services team
  o Identify deliverables necessary for successful service transition to Operations.
  o Participate in extended team status calls and planning meetings.
  o Participate in and/or facilitate Agile Scrum activities.
  o Consultant may utilize Customer provided data, scripts or internal process and tools documentation to assist in providing consulting support.

- The typical skill set and role of the Consultant(s) provided by Cisco to provide ITSM expertise may include:

  o Plan, design and/or lead in the development of ITSM processes identified above.
  o Facilitate standardization and adoption of ITSM processes within Customer Operations organization.
  o Serve as an advisor role to Customer in regards to operations excellence and/or operations transformation.
  o Provide Cisco and industry best practices to Customer regarding infrastructure and or IT service operations, including comparison against other industry operations maturity benchmarks.
  o Articulate "as a Service" industry practices.
  o Understanding of the Networking, Data Center and Cloud technology stack
  o Understanding of multiple ITSM and development methodologies which may include eTOM, COBIT, TOGAF and DevOps as well as ITIL.

Cisco Data Center Intelligent Automation Services

The Cisco Intelligent Automation (IA) Services will provide the following services for individual products that are part of IA product portfolio - services for individual products may vary for each theater and will be determined by each theater delivery lead.

Upgrade Assessment/Support

The Cisco Intelligent Automation (IA) Services will provide assessment and support services to determine the impact and effort associated with upgrading Customer's existing production instance from version XXXX.x to version XXXX.x Cisco will consult with Customer via a series of meetings to understand and analyze aspects of Customer's current environment.

Upgrade Assessment activities may include:

- Review Customer's existing production functionalities, including standard product configurations, integrations and customizations to determine the actions needed to maintain the existing functionality.

- Review current platform and hardware components to ensure accurate sizing
  o Includes platform matrix validation
  o Assess program growth and expansion

- Review new product features, product changes, benefits with Customer describing differences between existing and new application software versions and assess impact on existing configurations including potential fitness for use with Customer's existing implementation

- Document the applicability, effort and changes associated with utilizing new features and functions that are part of the new IA software release.

- Review customizations, integrations and assess needed changes to ensure continued compatibility and performance.

- Devise plan documenting findings and recommendation that includes one or more of:

  o Detailed impact, recommended strategy and estimate the level of effort required to complete the upgrade.
  o Review of Customer's project staffing capabilities and available resources/skill sets.
  o Plan and effort to remedy any issues uncovered during review process.
  o Contingency and rollback plans to restore the software to its original version
  o Plan and effort to utilize new desired product features.
  o Interactive presentation of findings, analysis, and recommendations.
  o Recommend a plan and effort to remedy any issues uncovered during review process.

Once per year, Cisco may provide Customer with following upgrade support service(s) to upgrade production environment(s).

Upgrade Support activities may include:

- Assist in upgrading to IA product XXXX.X environment

- Work with a third party, providing planning and resourcing for third party integration and product customization, where the Customer has engaged the third party and the Customer is paying for the third party engagement.

- Establish best practices for planning and running a IA product upgrade

- Analyze issues encountered and help categorize them into enhancements, deployment issues, and product defects

- Support Customer during the test execution

- Support Customer in migrating Test and Production environment

- Executing on any post-production support activities, as defined during scoping of Upgrade Project.

Site and Systems Administration Support

The Cisco Intelligent Automation Site and Systems Administration Support service is designed for site administrators responsible for the configuration, administration and maintenance of IA product implementation. It provides expert help to ensure day-to-day data center orchestration infrastructure operations using various IA products run smoothly and efficiently, with stable and scalable operations.

Cisco will provide remote support for the following activities that are generally performed:

- Monitoring of system activity
- Understanding and managing system growth
- Review existing monitoring and reporting capabilities and provide expert analysis and insights that addresses technical health of Customer's orchestration infrastructure
- Participate in system build and document the configuration of the system
- Document best practices for disaster recovery

Ongoing Support

Provide advanced technical support through a combination of onsite and/or remote technical architects

  o Provide periodic review of environments
  o Perform system health check reviews
  o Performance reviews
  o Liaise with TAC on support issues related to customizations or integration points
  o Ongoing, onsite consulting support in the form of a designated engineer ("Advanced Services Engineer") onsite at Customer's designated location to act as the primary interface with Customer, providing general advice and guidance related to Customer's IA environment, up to five days per week (pending local work restrictions) during Standard Business Hours excluding Cisco holidays, locally recognized country holidays, vacation, and training days. Customer directed tasks to be performed by the Advanced Services Engineer are subject to Cisco approval, which shall not be unreasonably withheld. Onsite IA Consulting Support is only available to certain geographic locations and will be specified in the Quote for Services.

Cisco Intelligent Automation for Cloud

Upgrade Assessment/Support

The Cisco Intelligent Automation for Cloud (Cisco IAC) will provide assessment and support services to determine the impact and effort associated with upgrading Customer's existing Cisco IAC production instance from version XXXX.x to version XXXX.x. Cisco will consult with Customer via a series of meetings to understand and analyze aspects of Customer's current Cisco IAC environment.

Once per year, Cisco may provide Customer with following Cisco IAC Health Check service(s) to production and/or non-production Cisco IAC environment(s).

  o Review current configuration of Cisco IAC solution as part of a periodic examination of post deployment, or audited, environments, that require additional examination guided by Customer needs and concerns. Cisco IAC Health

Checks are structured to service instances within a single data center environment. Periodic activities may include:

o Review and analysis of Cisco IAC solution's including standard product configurations, integrations and customizations
o Review current platform and hardware components to understand any sizing and product compatibility issues with third party applications.
o Develop report on the environment as evaluated against best practices and expected server response times.

Once per year, Cisco may provide Customer with following upgrade assessment service(s) to upgrade production and/or non-production Cisco IAC environment(s).

▪ Review Customer's existing production functionalities, including standard product configurations, integrations and customizations to determine the actions needed to maintain the existing functionality.

▪ Review current platform and hardware components to understand any sizing and product compatibility issues with third party applications.

▪ Review new product features, product changes, benefits with Customer describing differences between existing and new application software versions and assess impact on existing configurations including potential fitness for use with Customer's existing implementation

▪ Review customizations, integrations and assess needed changes to ensure continued performance.

▪ Determine the feasibility, effort and risk associated with utilizing new features and functions that are part of the upgraded Cisco IAC software.

▪ Complete review sessions with Customer's project team on their steps taken to date and current status, resulting in an assessment of recommended next steps and upgrade plans.

▪ Devise a plan documenting findings and recommendation that include:

o Detailed impact, recommended strategy and estimate the level of effort required to complete the upgrade.
o Review of Customer's project staffing capabilities and available resources/skill sets.
o Plan and effort to remedy any issues uncovered during review process.
o Contingency and rollback plans to restore the software to its original version
o Plan and effort to utilize new desired product features.

o Interactive presentation of findings, analysis, and recommendations.
o Recommend a plan and effort to remedy any issues uncovered during review process.

Once per year, Cisco may provide Customer with following upgrade support service(s) to upgrade production Cisco IAC environment(s).

▪ Assist in upgrading to Cisco IAC XXXX.X environment including third party integration and product customization

▪ Establish best practices for planning and running a Cisco IAC system upgrade

▪ Analyze issues encountered and help classify them into enhancements, deployment issues, and product defects

▪ Support Customer during the test execution

▪ Support Customer in migrating Test and Production environment

▪ Executing on any post-production support activities, as planned.

Site and Systems Administration Support

The Cisco Intelligent Automation for Cloud (CIAC) Site and Systems Administration Support service is designed for site administrators responsible for the configuration, administration and maintenance of Cisco IAC implementation. It provides expert help to ensure day-to-day data center orchestration infrastructure operations using Cisco IAC run smoothly and efficiently, with stable and scalable operations.

Cisco will provide remote support for the following activities that are generally performed:

• Perform site administration that includes site settings, custom styles and authorization structures
• Creating and managing organization units, people, queue and groups
• Configuration management best practices and overview of service catalog
• Troubleshooting services such as role and permission issues
• Provide architecture support that includes deployment topology and platform support, directory integration as appropriate
• Manage configuration files for web server, application server, data sources and logging
• Provide periodic reporting and analytics
• Ongoing maintenance tasks such as tuning system and database for application performance, catalog governance and managing cross-environment migration, monitoring and troubleshooting tools/techniques

Ongoing Support

This service will provide support to assist Customer with general advice and guidance on Cisco recommendations around Cisco IAC solution to implement fully featured private, public or hybrid cloud solutions that include Customer-specific cloud portals, service catalogs, and orchestration workflows to transform the automation capabilities in a wide spectrum of existing Customer IT infrastructures, addressing the management automation requirements.

This consulting role complements expertise and activities already provided and available as part of other Cisco Advanced Services. This service provides a Cisco consultant with specialist Cisco IAC knowledge as part of the Customer's team to participate in and advise on all aspects of fully leveraging the Customer's investment in Cisco IAC products.

A Quarterly Business Review is conducted to plan how best to use Ongoing Support in the following quarter and review how effective the support has been in the previous quarter.

This service will include support and technical leadership from an Advanced Services Engineer available for five (5) days per week (pending local work restrictions) during Normal Business Hours excluding Cisco holidays, locally recognized country holidays, vacation, and training days.

Designate an engineer ("Advanced Services Solution Architect") to act as the primary interface with Customer for its data center management automation requirements.
o Participate in regular visits to the Customer either via phone, email or in-person to review proactive deliverables and activities and to plan for next quarter.

o Participate in periodic conference calls (usually weekly) to review Customer's data center status, planning and the Services being provided.

o Monitor a Customer-specific Cisco email alias to facilitate communication with primary Advanced Services Engineer as well as the engineers on the Cisco's Data Center team.

o Make collaboration tools available for the purposes of (including but not limited to): hosting meetings, managing documentation, instant messaging, desktop sharing, and collaborative spaces.

o Optionally, provide ongoing, onsite consulting support in the form of a designated engineer ("Advanced Services Engineer") onsite at Customer's designated location to act as the primary interface with Customer, providing general advice and guidance related to Customer's IA environment, up to five days per week (pending local work restrictions) during Standard Business Hours excluding Cisco holidays, locally recognized country holidays, vacation, and training days. Customer directed tasks to be performed by the Advanced Services Engineer are subject to Cisco approval, which shall not be unreasonably withheld. Onsite IA Consulting Support is only available to

certain geographic locations and will be specified in the Quote for Services.

Cisco Network Operations Automation Services

The Cisco Network Operations Automation Service is intended to automate proactive and reactive network operations tasks, integrating Cisco best practices with the Customer's operational process and tool environment. This service is intended to supplement a current maintenance agreement for Cisco products and is only available where all Product(s) in Customer's Network is supported with a minimum of core services (such as SMARTnet and/or Software Application Services) as applicable.

Upgrade Assessment/Support

The Cisco Network Operation Automation Service (CNOAS) will provide assessment and support services to determine the impact and effort associated with upgrading Customer's existing CNOAS solution to appropriate new version. Cisco will consult with Customer via a series of meetings to understand and analyze aspects of Customer's current CNOAS Environment. Cisco will provide assessment services to:

o Review Customer's existing production functionalities, including standard product configurations, integrations and customizations to determine the actions needed to maintain the existing functionality.
o Review current platform and hardware components to understand any sizing and product compatibility issues with third party applications
o Review new product features, product changes, benefits with Customer describing differences between existing and new application software versions and assess impact on existing configurations including potential fitness for use with Customer's existing implementation
o Review customizations, integrations and assess needed changes to ensure continued performance.
o Determine the feasibility, effort and risk associated with utilizing new features and functions that are part of the upgraded CNOAS software.
o Complete review sessions with Customer's project team on their steps taken to date and current status, resulting in an assessment of recommended next steps and upgrade plans.
o Devise a plan documenting findings and recommendation that include:
o Detailed impact, recommended strategy and estimate the level of effort required to complete the upgrade.
o Review of Customer's project staffing capabilities and available resources/skill sets.
o Plan and effort to remedy any issues uncovered during review process.
o Contingency and rollback plans to restore the software to its original version
o Plan and effort to utilize new desired product features.

o Interactive presentation of findings, analysis, and recommendations.
o Recommend a plan and effort to remedy any issues uncovered during review process.

- Once per year, Cisco may provide Customer with following upgrade service(s) on site for up to a maximum of five (5) business days to upgrade non-production CNOAS environment(s):
o Provide one (1) upgrade for each non-production CNOAS element(s)
o Provide testing of upgraded environment by executing one (1) of each software element and one (1) of each agent/adapter to be used in the CNOAS solution. Support Customer during the test execution
o Provide fix of any corruptions found during the validation
o Provide one (1) knowledge transfer session for up to a maximum of twelve (12) Customer participants at Customer facility, for up to one (1) day
o Test upgrade and the differences between the prior CNOAS version and the upgraded CNOAS version
o Reach agreement on the actual location and the commencement date for the knowledge transfer session within five (5) business days prior to the start of the upgrade engagement
o Once per year, Cisco may provide Customer with an provide the following upgrade service(s) on site for up to a maximum of five (5) business days to upgrade production CNOAS environment(s):
- Provide one (1) upgrade for each production CNOAS element(s)
- Provide testing of all Production CNOAS Fault tolerant environment elements (Primary Master, Backup Master and Fault Monitor)
- Provide fix of any corruptions found during the validation
- Provide upgrade of up to five (5) desktop client(s) in production environment
- Provide cut over support for each upgraded production environment(s)
- Provide post go live support for up to 10 business days and assist in resolving any upgrade related issues during go live.
o Once per year, Cisco may provide workflow customization for mutually agreeable Customer pain points identified for up to 5 workflows within up to a maximum of five (5) business days per workflow
o Once per year, Cisco may provide the following upgrade service(s) on site for both production and non-production CNOAS environment(s) mentioned above for up to a maximum of five (5) business days:
- For each environment that is candidate for upgrade, provide health and risk assessment of Customer environment for the current CNOAS configuration, architecture, operating system (OS), database (DB), and workflows in CPO
- Review and provide recommendation on Customer developed contingency plan
- Provide fix of any corruptions found during the validation

- Provide testing of upgraded component connectivity (CPO, database, adapters, targets)

The quantity of any reporting and efforts for upgrade and assessment activities described herein will vary depending on Customer requirements and what Customer and Cisco mutually agree upon when Services are purchased as identified in the Quote provided by Cisco.

Site and Systems Administration Support

- Cisco will consult with Customer to support Site and System administration that is process of maintaining and operating computer systems and networks as part of CNOAS solution (CPO, database, adapters, targets). Cisco will provide support for the following responsibilities that are generally performed:
- Perform routine audits of CNOAS solution
- Perform backups of CNOAS solution
- User management and user security administration such as add, remove, or update user account information, reset passwords, etc.
- Tune system performance
- Routine tasks to operate the CNOAS solution
- Provide architecture blueprint for CNOAS solution
- Participate in system build and document the configuration of the system
- Implementation of approved operating system updates, patches, and configuration changes
- Provide knowledge transfer of CNOAS Best Practices
- Provide periodic status report to management on tasks delivered and recommendations

The quantity of any reporting and efforts for site and system administration activities described herein will vary depending on Customer requirements and what Customer and Cisco mutually agree upon when Services are purchased as identified in the Quote provided by Cisco.

Ongoing Support

This service will provide support to assist Customer with general advice and guidance on Cisco recommendations around CNOAS solution. A maximum of twenty (20) custom workflows support will be provided.

- Designate an engineer ("Advanced Services Engineer") to act as the primary interface with Customer for its CNOAS solution. This engineer would be available for five (5) days per week (pending local work restrictions) during Normal Business Hours excluding Cisco holidays, locally recognized country holidays, vacation, and training days.
- Participate in regular visits to the Customer either via phone, email or in-person to review proactive deliverables and activities and to plan for next quarter. In-person visits not to exceed five (5) days in aggregate. Additional visits will be mutually agreed at Cisco's then-current travel and labor rates.

- Ongoing support service's scope focuses on content and Cisco recommendations around CNOAS solution
- Participate in periodic conference calls (usually Bi-weekly or Monthly) at mutually agreeable time for an hour to review Customer's CNOAS solution status, address questions, planning and the services being provided.
- Monitor a Customer-specific Cisco email alias to facilitate communication with primary Advanced Services Engineer as well as the engineers on the Cisco's CNOAS team. Respond to Customer emails within 24-48 hours with acknowledgement and start working with Customer on the plan to address the topic of the email.
- Advanced Services Engineer will provide general advice and guidance to lead the delivery of the CNOAS solution ordered by Customer.
- Make collaboration tools available for the purposes of (including but not limited to): hosting meetings, managing documentation, instant messaging, desktop sharing, and collaborative spaces.

The quantity of any reporting and efforts for ongoing activities described herein will vary depending on Customer requirements and what Customer and Cisco mutually agree upon when Services are purchased as identified in the Quote provided by Cisco.

Custom Solution Support - Day 2 Reactive

Upon identification of a problem related to Customer solution and receipt of an error report from Customer containing a detailed description of the nature of the defect or error in the solution, the conditions under which it occurs and other relevant information sufficient to enable Cisco to reproduce the error in order to verify its existence and diagnose its cause, Cisco will use reasonable commercial efforts to furnish Customer an avoidance procedure, bypass, work-around or patch to correct or alleviate the condition reported

Prepare & Present QBR

o Schedule with Customer up to four (4) quarterly visits per year (not to exceed eight (8) days in aggregate) to Customer's site to review Deliverables and activities and plan for the next quarter. Additional visits will be mutually agreed upon at Cisco's then-current travel and labor rates.

Workshop

o Conduct a workshop for up to two (2) working days with business and IT stakeholders to identify pain points in Customer's network environment.
o Review with Customer their network's current capabilities and discuss possible capabilities with help of CNOAS solution that allows the team to identify the desired automation goals and objectives. The workshop plays a vital tool for generating recommendations that optimize the

value gained from the automation process and provide a technical blueprint.
o Document findings including any gaps and recommended actions for the CNOAS solution workflow development for automation process.

Ongoing Service and Project Management Support

o Provide ongoing support and project management to assist with the overall delivery of the Data Center Optimization Service for incremental changes to the CNOAS environment.

Cisco Workload Automation Services

Assessment

o Once per year, Cisco will provide Customer with an product-based assessment to facilitate proper changes in the existing environment, which may include:
- Provide server side and application assessment of the Customer environment by performing detailed analysis of the following topics and provide recommendation:
o Application Assessment - Current job setup, Security, Events/Actions, Notification Process, Variable usage, Global Configuration, Default Configuration, Job activity view and its usage efficiency, Queues and agent outage management
o Server/Hardware Assessment - Hardware setup and server application, Supporting software prerequisites, Database usage and growth, All TES components, Client, Master, Agents and Database
- Provide system health check services for the Tidal Enterprise Scheduler. Health check will include the following items:
o Tidal Enterprise Scheduler Architecture
o Assessing the existing staff supporting the TES application and provide training recommendations
o Existing Jobs setup and processes defined in TES
o Provide recommendations to adhere to best practices
o Provide Tidal server tuning recommendation based on application performance, job volume, and user interaction
o The quantity of any reporting and efforts for assessment activities described herein will vary depending on Customer requirements and what Customer and Cisco mutually agree upon when Services are purchased as identified in the Quote provided by Cisco.

Upgrade Assessment/Support

- Once per year, Cisco may provide Customer with the following upgrade service(s) on site for up to a maximum of four (4) business days to upgrade non-production Tidal Enterprise scheduler Environment (TES) environment(s):

- o Provide one (1) upgrade for each non-production TES environment (s)
- o Provide database integrity validation using Cisco proprietary internal database corruption checker tool (DBCC) for each upgraded TES environment
- o Provide health check and risk assessment of Customer environment for the current TES configuration,
- o Provide fix of any corruptions found during the validation
- o Provide upgrade or installation of client manager in non production environment
- o Provide testing of upgraded component connectivity (master, database, agents, adapters, client managers)

- o Provide testing of upgraded environment by executing one (1) of each job type and one (1) of each agent/adapter type defined. Support Customer during the their test execution
- o Provide one (1) knowledge transfer session for up to a maximum of twelve (12) Customer participants at Customer facility, for up to one (1) day consisting of information concerning the following topics:
- o Test upgrade and the differences between the prior TES version and the upgraded TES version
- o Tidal Transporter upgrade new features and best practices if applicable.
- o Reach agreement on the actual location and the commencement date for the knowledge transfer session within five (5) business days prior to the start of the upgrade engagement
- o Once per year, Cisco may provide Customer with the following upgrade service(s) on site for up to a maximum of seven (7) business days to upgrade production Tidal Enterprise scheduler Environment (TES) environment(s):
- o Provide one (1) upgrade for each production TES environment(s)
- o Provide database integrity validation using Cisco proprietary internal database corruption checker tool (DBCC) for each upgraded TES environment
- o Provide health check and risk assessment of Customer environment for the current TES configuration,
- o Provide fix of any corruptions found during the validation
- o Provide testing of all Production TES elements (Primary Master, Backup Master and Fault Monitor if applicable)
- o Provide upgrade or installation of client manager in production environment
- o Provide cut over/post go live support for each upgraded production environment(s)
- The quantity of any reporting and efforts for upgrade assessment/support activities described herein will vary depending on Customer requirements and what Customer and Cisco mutually agree upon when Services are purchased as identified in the Quote provided by Cisco.

Site and Systems Administration Support

- Cisco will consult with Customer to support the TES application. Cisco will provide support for the following responsibilities that are generally performed:
- o Fine Tune TES master /components
- o Provide knowledge transfer of TES Best Practices for History and log retention settings, Jobs alerts and notifications, security administration, job setup.
- o Job setup and maintenance of jobs and schedules
- o Perform routine tasks to operate the Workload Automation Solution
- o Provide architecture blueprint for Workload Automation Solution.
- o Implementation of approved operating system updates, patches, and configuration changes
- o Provide training for the following: Intermediate, Advanced, Administrator, Operator
- o Provide periodic status report to management on tasks delivered and recommendations
- The quantity of any reporting and efforts for site and systems administration support activities described herein will vary depending on Customer requirements and what Customer and Cisco mutually agree upon when Services are purchased as identified in the Quote provided by Cisco.

Ongoing Support

Designate an engineer ("Advanced Services Engineer") to act as the primary interface with Customer for its Tidal Enterprise Scheduler solution. This engineer would be available for five (5) days per week (pending local work restrictions) during Normal Business Hours excluding Cisco holidays, locally recognized country holidays, vacation, and training days.

- Participate in regular discussion with the Customer either via phone or email to review proactive deliverables and activities and to plan for next support session.
- Ongoing support service's scope focuses on content and Cisco recommendations around Tidal Enterprise Scheduler solution
- Participate in periodic conference calls (usually Bi-weekly or Monthly) at mutually agreeable time for an hour to review status, address questions, planning and the services being provided.
- Monitor a Customer-specific Cisco email alias to facilitate communication with primary Advanced Services Engineer as well as the engineers on the Cisco's Tidal Enterprise Scheduler team. Respond to Customer emails within 24-48 hours with acknowledgement and start working with Customer on the plan to address the topic of the email.
- Advanced Services Engineer will provide general advice and guidance to lead the delivery of the Tidal Enterprise Scheduler solution ordered by Customer.

- Make collaboration tools available for the purposes of (including but not limited to): hosting meetings, managing documentation, instant messaging, desktop sharing, and collaborative spaces.

The quantity of any reporting and efforts for ongoing activities described herein will vary depending on Customer requirements and what Customer and Cisco mutually agree upon when Services are purchased as identified in the Quote provided by Cisco.

Custom Design Day 2 Reactive Support

- This service applies to applications that have been developed by Cisco in a previous service
- Upon identification of a problem related to the Customer solution and receipt of an error report from Customer containing a detailed description of the nature of the defect or error in the solution, the conditions under which it occurs and other relevant information sufficient to enable Cisco to reproduce the error to verify its existence and diagnose its cause, Cisco will use reasonable commercial efforts to furnish Customer an avoidance procedure, bypass, work-around or patch to the Cisco-developed application to correct or alleviate the condition reported.

Connected Grid Energy Optimization Service ("EOS")

Service Summary

Connected Grid Energy Optimization Service provides for optimization of the use of energy by the information and communication technology infrastructure. This software based system leverages Cisco EnergyWise and provides for costs and greenhouse gas savings related to the energy usage of IT systems.

Customer Requirements Document ("CRD") Development

- Collaborate with the Customer to remotely collect and document Customer's communicated business requirements to be used by the high-level network design. The Customer requirements may include:

  o Energy Management features and functionality are required to meet business objective.

  o Review and analyze the existing Network, Compute and Storage architectures for performance, IT and building load analysis, Hardware and Software, energy reporting and management.

- Provide and maintain a Customer Requirements Document ("CRD") that contains Customer requirements, collected data, information, observations, and the results of the high level analysis during the duration of the service.

Discovery and Information Gathering

The remote energy discovery process is a low cost way for a Cisco field team and Customer uncover a high level ROI for implementing a new energy management system. This financial analysis can be presented remotely or on day 1 of on-site workshop. This is a high-level energy discovery typically for a subset of the larger IT architecture.

- Discovery and Information Gathering / Remote Access Required
- Requirements Gathering and Discovery / Remote
- Asset Inventory Transfer / Remote
- Qualification and Evaluation / Remote
- Mechanical, Electrical, Floor Plans Transfer / Remote
- Presales Coordination / Remote
- Discovery and Information Gathering / Remote Access Required
- Provide a site survey report detailing the results of the energy discovery tool.

The on-site energy discovery process provides for a detailed ROI for implementing a new energy management system. This financial analysis is presented remotely during the assessment period. This is a low-level energy discovery typically for the larger IT architecture.

- Discovery and Information Gathering / On-site
- Site Inventory Discovery / On-site
- Requirements gathering & analysis / On-site
- Detailed IT and Facilities Components Assessments / On-site
- Collaborate with Customer to determine Future State Design / On-site
- Assist the Customer in the creation of its high level Energy Management System design and as part of the collaboration:

- Review and assist Customer the high-level Network architecture and topology design.

- Identify integration and aggregation points for energy domains across Building Management Systems, Network, Compute and Storage.

- Review Customer designs for IT System application environment, access requirements, efficiency metrics, reporting capabilities, hardware tiering, hardware compliance and configuration provide recommendations.

- Financial modeling and analysis across facilities and IT operations showing ROI and projected savings by business unit. / onsite

Energy Management Assessment

The Energy Management tools and processes involve the installation and integration of a new energy management application. This application provides the Customer with an active tool to manage the energy usage of IT assets. Furthermore, the reporting and tracking of energy use is

supported. The final deliverable document includes the cost justification for the system, initial findings and user guide for the energy management system.

- Data Aggregation, Domain Building, Reporting Templates
- Planning (Requirements, Assessment, Architecture)
- Design & Build (Solution Design, Integration, Implementation)
- Expense Assessment (Operational & Architectural Assessment)
- Run & Optimize (Deployment Planning, Operational Assessment, Optimization)
- IT assets utilization mapping
- Efficiency Metrics Calculations
- Energy Management Strategy
- Energy Management Report Compilation
- Provide Customer Report - Executive Presentation

Energy Management Support and Knowledge Transfer
Once the energy assessment is complete, the Cisco service team will work with the Customer to develop a new energy management program. This program focuses on providing Energy as a Service (Eaas) for energy managers and IT operators. This program and training that is provided by Cisco have the following attributes:

- User training workshops
- Recommendations of organizational structure
- Recommendations on programmatic structure
- Reporting templates for compute, network and storage assets
- Data feed for data center digital signage
- Report showing projections on energy savings over 3 year period for single data center
- Report showing projected savings for additional sites as provided by client

Cisco shall provide the following General Service provisions for any Connected Grid Energy Optimization Service specified in the Quote:

- Under this Service, Cisco shall provide the Connected Grid Energy Optimization Service during Standard Business Hours, unless stated otherwise.

- Provide a single point of contact ("Cisco Project Manager") for all issues relating to the Services.

- Participate in regularly scheduled meetings with the Customer to discuss the status of the Services.

- Define and execute change management process which includes informing Customer of risks and negotiating changes to the schedule and the budget based upon the agreed upon changes.

- Maintain project plan and risk management and change management processes.

- Manage project cost and resource budget.

- Provide periodic project progress report throughout the performance of service.

- Provide Customer satisfaction surveys to Customer.

- Ensure Cisco employees (including Cisco subcontractors) conform to Customer's reasonable workplace policies, conditions and safety regulations that are consistent with Cisco's obligations herein and that are provided to Cisco in writing prior to commencement of the Services; provided, however, that Cisco's personnel or subcontractors shall not be required to sign individual agreements with Customer or waive any personal rights.

- Supply Cisco project team personnel with a displayable form of identification to be worn at all times during services activities at Customer's facility.

- Cisco reserves the right to determine which of its personnel shall be assigned to a particular project, to replace or reassign such personnel and/or subcontract to qualified third persons part or all of the performance of any Connected Grid Energy Optimization Service hereunder. Should Customer request the removal or reassignment of any Cisco personnel at any time; however Customer shall be responsible for extra costs relating to such removal or reassignment of Cisco personnel. Cisco shall not have any liability for any costs, which may occur due to project delays due to such removal or reassignment of Cisco personnel.

Project Completion

- Work with Customer to remove Data Collection Tool from server.
- Delete Customer account on cloud consumption web portal.

Cloud Onboarding Automation Factory

Ongoing Service and Project Management Support

o Provide ongoing support and project management to assist with the overall delivery of the Cloud Onboarding Migration as a Service for use of the automated migration as a service tool.

Knowledge Transfer

o Cisco will consult with Customer to identify requirements and topics for informal training sessions related to Cisco Cloud Onboarding Migration as a Service solution. Remote Knowledge Transfer Sessions are:

▪ Delivered in English (other languages subject to availability)

- Informal technical updates such as a "chalk talk" on a topic that is mutually agreed upon and relevant to the technologies in the data center.
  - Service to be provided by an Advanced Services Engineer or another senior Cisco engineer.
  - Delivered remotely for up to four (4) hours in length, with no labs and no printed course materials
  - Relevant to the Cloud Onboarding Migration as a Service solution – as deployed in Customer's data center

Usage of Automated Workload Migration Toolset

o Provide ability for Customer to perform migrations via the Cisco cloud onboarding automated migration as a service tool.

o The maximum number of migrations allowed is specified at time of order,

Ongoing Tool Support

o Provide ongoing support for technical issues encountered during usage of the Cisco cloud onboarding automated migration as a service tool. This will be limited to providing support around technical issues encountered during usage of the tool but not including migration challenges.

Migration Support

o Provide ongoing support to assist with workload migration issues encountered as output from the Cisco cloud onboarding automated migration as a service tool. This will be limited to providing support around migration issues encountered during and after usage of the tool but not including technical support issues.

o Provide ongoing support to assist with migration tasks still remaining after usage of the cloud onboarding automated migration as a service tool, including for example target workload related configuration tasks, data transfer, and workload installation and instantiation tasks

Systems Integration Support

o Provide ongoing support and advice to aid integration of the cloud onboarding automated migration as a service tool with Customer operational support systems. This will be limited to providing advice and guidance on integration options and design, and will not include implementation work.

o Work with a third party, providing planning, advice and guidance for third party integration with the cloud onboarding automated migration as a service tool, where the Customer has engaged the third party and the Customer is paying for the third party engagement.

o Provide advice and guidance with respect to new releases of the cloud onboarding automated migration as a service tool and the impact of such new releases on existing third party integrations.

Day 2 Data Center Custom Workflow

The Day 2 Data Center Custom Workflow Service provides Customer with ongoing reactive support for custom workflow developed as part of the solution in existing network environment.

Cisco IAC Day 2 Custom Workflow Support

Cisco IAC Day 2 Reactive Workflow Support Service includes support of Cisco for the duration of the service contract. Services include:

- Cisco will respond to Customer with the following response time for support calls and it was clearly identified by Cisco TAC that problem is related to the custom workflow developed and put in production by Cisco.

  - Cisco will respond within four (4) hours for Severity 1 and Severity 2 calls and within twenty four (24) hours for Severity 3 and Severity 4 after Cisco TAC identifies that problem is related to custom workflow for all calls outside Standard Business hours.

- Provide support via Cisco.com, telephone, or electronic mail, as appropriate, during Standard Business Hours.

- Designate a single point of contact for all Cisco communication during the problem resolution period. This person would have access to engineers familiar with the Cisco IAC Custom Workflow, who will provide support and basic problem resolution services to Customer and respond to Customer's requests. This person has the authority to act on all aspects of the work being performed.

- Upon request from Customer, Cisco will access Customer's system via remote network connection to analyze problems. This is done with Customer's permission only, and Cisco personnel will access only those systems authorized by Customer. Cisco may provide Customer with Cisco software to assist with problem diagnosis and/or resolution. Such Cisco software is the property of Cisco and will be returned to Cisco promptly upon request.

- Cisco will work with the Customer to capture data about the current environment and   Upon identification of a problem related to custom workflow and receipt of an error report from Customer containing a detailed description of the nature of the defect or error in the workflow, the conditions under which it occurs and other relevant information sufficient to enable Cisco to reproduce the error in order to verify its existence and diagnose its cause, Cisco will guide the Customer to a fix in terms of an avoidance procedure, bypass, work-around or patch to correct or alleviate the condition reported. Cisco will identify if problem can be fixed by Cisco or provide guidance to Customer that it requires third party to resolve

the issue related to their third party solution or provide guidance to Customer that problem resolution requires feature enhancements (may not be part of the scope of this service contract) to resolve the issue.

- Once the Cisco IAC custom workflow related problem is fixed by Cisco, Cisco would, perform testing against the Customer provided Verification Test Plan to show full functionality in accordance with the Verification Test Plan. Extent of testing within the Verification Test Plan is decided by Cisco to focus on problem at hand and based on Customer's environment.

- Provide the results of the testing to the Customer.

- If such fix requires any software upgrade/updates then Cisco will provide instructions on how to retrieve such software.

- Assist the Customer in communicating the problem to the third party vendor and facilitating any required follow-up with the third party when problem involves third party software as part of Cisco delivered solution.

- Recreate the problem in Cisco's own lab environment to isolate the problem and provide required fixes to the Customer for problem resolution when necessary.

- Provide regular update to the Customer once a month or quarter as agreed with the Customer for Cisco IAC Custom Workflow problems encountered by Customer.

- Designate a backup contact when Cisco contact is unavailable. This person has the authority to act on all aspects of the work being performed in absence of the primary contact.

- Break-fix support for Cisco IAC custom workflow implemented by Cisco.

OpenStack Day 2 Custom Workflow Support

OpenStack Day 2 Custom Workflow Support Service provides Customer with ongoing reactive support for custom workflow developed as part of the solution in the Cisco-deployed existing OpenStack environment.

OpenStack Day 2 Reactive Workflow Support Service includes support of Cisco for the duration of the service contract. Services include:

- Cisco will respond to Customer with the following response time for support calls and it was clearly identified by Cisco TAC that problem is related to the custom workflow developed and put in production by Cisco.

  - Cisco will respond within four (4) hours for Severity 1 and Severity 2 calls and within twenty four (24) hours for Severity 3 and Severity 4 after Cisco TAC identifies that problem is related to custom workflow for all calls outside Standard Business hours.

- Provide support via Cisco.com, telephone, or electronic mail, as appropriate, during Standard Business Hours.

- Designate a single point of contact for all Cisco communication during the problem resolution period. This person would have access to engineers familiar with the OpenStack Custom Workflow, who will provide support and basic problem resolution services to Customer and respond to Customer's requests. This person has the authority to act on all aspects of the work being performed.

- Upon request from Customer, Cisco will access Customer's system via remote network connection to analyze problems. This is done with Customer's permission only, and Cisco personnel will access only those systems authorized by Customer. Cisco may provide Customer with Cisco software to assist with problem diagnosis and/or resolution. Such Cisco software is the property of Cisco and will be returned to Cisco promptly upon request.

- Cisco will work with the Customer to capture data about the current environment and problem at hand. Upon identification of a problem related to custom workflow and receipt of an error report from Customer containing a detailed description of the nature of the defect or error in the workflow, the conditions under which it occurs and other relevant information sufficient to enable Cisco to reproduce the error in order to verify its existence and diagnose its cause, Cisco will guide the Customer to a fix in terms of an avoidance procedure, bypass, work-around or patch to correct or alleviate the condition reported. Cisco will identify if problem can be fixed by Cisco or provide guidance to Customer that it requires third party to resolve the issue related to their third party solution or provide guidance to Customer that problem resolution requires feature enhancements (may not be part of the scope of this service contract) to resolve the issue.

- Once the OpenStack custom workflow related problem is fixed by Cisco, Cisco would, perform testing against the Customer provided Verification Test Plan to show full functionality in accordance with the Verification Test Plan. Extent of testing within the Verification Test Plan is decided by Cisco to focus on problem at hand and based on Customer's environment.

- Provide the results of the testing to the Customer.

- If such fix requires any software upgrade/updates then Cisco will provide instructions on how to retrieve such software.

- Assist the Customer in communicating the problem to the third party vendor and facilitating any required follow-up with the third party when problem involves third party software as part of Cisco delivered solution.

- Recreate the problem in Cisco's own lab environment to isolate the problem and provide required fixes to the Customer for problem resolution when necessary.

- Provide regular update to the Customer once a month or quarter as agreed with the Customer for OpenStack Custom Workflow problems encountered by Customer.

- Designate a backup contact when Cisco contact is unavailable. This person has the authority to act on all aspects of the work being performed in absence of the primary contact.

- Break-fix support for OpenStack custom workflow implemented by Cisco.

Application Centric Infrastructure (ACI) Optimization Services

Application Centric Infrastructure (ACI) Day 2 Reactive Custom Workflow Support

The Application Centric Infrastructure (ACI) Day 2 Custom Workflow Support Service provides Customer with ongoing reactive support for custom workflow developed as part of the solution in existing ACI/Nexus 9000 network environment.

ACI Day 2 Reactive Workflow Support Service includes support of Cisco for the duration of the service contract. Services include:

- Cisco will respond to Customer with the following response time for support calls and it was clearly identified by Cisco TAC that problem is related to the custom workflow developed and put in production by Cisco.

  - Cisco will respond within four (4) hours for Severity 1 and Severity 2 calls and within twenty four (24) hours for Severity 3 and Severity 4 after Cisco TAC identifies that problem is related to custom workflow for all calls outside Standard Business hours.

- Provide support via Cisco.com, telephone, or electronic mail, as appropriate, during Standard Business Hours.

- Designate a single point of contact for all Cisco communication during the problem resolution period. This person would have access to engineers familiar with the ACI Custom Workflow, who will provide support and basic problem resolution services to Customer and respond to Customer's requests. This person has the authority to act on all aspects of the work being performed.

- Upon request from Customer, Cisco will access Customer's system via remote network connection to analyze problems. This is done with Customer's permission only, and Cisco personnel will access only those systems authorized by Customer. Cisco may provide Customer with Cisco software to assist with problem diagnosis and/or resolution. Such Cisco software is the property of Cisco and will be returned to Cisco promptly upon request.

- Cisco will work with the Customer to capture data about the current environment and problem at hand. Upon identification of a problem related to custom workflow and receipt of an error report from Customer containing a detailed description of the nature of the defect or error in the workflow, the conditions under which it occurs and other relevant information sufficient to enable Cisco to reproduce the error in order to verify its existence and diagnose its cause, Cisco will guide the Customer to a fix in terms of an avoidance procedure, bypass, work-around or patch to correct or alleviate the condition reported. Cisco will identify if problem can be fixed by Cisco or provide guidance to Customer that it requires third party to resolve the issue related to their third party solution or provide guidance to Customer that problem resolution requires feature enhancements (may not be part of the scope of this service contract) to resolve the issue.

- Once the ACI custom workflow related problem is fixed by Cisco, Cisco would, perform testing against the Customer provided Verification Test Plan to show full functionality in accordance with the Verification Test Plan. Extent of testing within the Verification Test Plan is decided by Cisco to focus on problem at hand and based on Customer's environment.

- Provide the results of the testing to the Customer.

- If such fix requires any software upgrade/updates then Cisco will provide instructions on how to retrieve such software.

- Assist the Customer in communicating the problem to the third party vendor and facilitating any required follow-up with the third party when problem involves third party software as part of Cisco delivered solution.

- Recreate the problem in Cisco's own lab environment to isolate the problem and provide required fixes to the Customer for problem resolution when necessary.

- Provide regular update to the Customer once a month or quarter as agreed with the Customer for ACI Custom Workflow problems encountered by Customer.

- Designate a backup contact when Cisco contact is unavailable. This person has the authority to act on all aspects of the work being performed in absence of the primary contact.

- Break-fix support for ACI custom workflow implemented by Cisco.

General Support

o Establish a Customer-specific Cisco email alias to facilitate communication with Cisco engineers such as Advanced Services Engineers, Solution Engineers and Architects.

o Provide certain updates to Software Tools that Cisco identifies as appropriate for the Workload Automation solution related tasks during the performance of the Service, provided that all fees due and owing to Cisco under this Service Description have been paid. Software Tools may or may not include Hardware or Software. Customer acknowledges and agrees that Cisco shall retain full right, title and interest to the Software Tools. In addition to Cisco provided tools, the Advanced Services Consultant may utilize Customer provided data, scripts, internal or third party tools to assist in integration of support automation workflows

o Setup a joint collaboration file-sharing location with Customer to facilitate collaboration and knowledge exchange related to Service herein.

o Cisco may use an email alias, surveys or interviews to obtain Feedback on the Service.

SAP HANA Optimization

• Review current configuration of SAP HANA components as part of a periodic examination of post deployment, or audited, environments, that require additional examination guided by Customer needs and concerns.

• Provides a healthcheck in relation to SAP HANA, with the following activities:

o Scheduled quarterly maintenance and upgrade of HANA appliance components.

o UCS firmware, UCS manager, SUSE OS, Internal Networking, SAP HANA application, storage*

o Ad hoc security upgrade support for OS and version updates to HANA

o Operational support and knowledge transfer for HANA appliance

o Expansion of HANA to additional nodes, chassis and storage

Customer Responsibilities
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o Designate at least two (2) but not more than six (6) technical representatives in each area covered under DC including UCS, Nexus, SAN, L4/7, caching, server, Operations and automation(tools) who must be Customer's employees in a centralized Network support center (Customer's technical assistance center), to act as the primary technical interface to the Advanced Services Engineer(s) covering Data Center technologies. Customer will designate as contacts senior engineers with the authority to make any necessary changes to the data center device

configuration. One individual, who is a senior member of management or technical staff, will be designated as Customer's primary point of contact to manage the implementation of services selected under this Service Description (e.g., chair the weekly conference calls, assist with prioritization of projects and activities).

o Within one (1) year from the commencement of this Services, Customer will have at least one (1) Cisco Certified Internetworking Expert ("CCIE") trained employee or one (1) employee that have achieved, in Cisco's sole determination, an equal standard through training and experience as designated contacts.

o Customer's technical assistance center shall maintain centralized network management for its Network supported under this Service Description, capable of providing Level 1 and Level 2 support.

o Provide reasonable electronic access (onsite and remote) to Customer's Network to allow the Advanced Services Engineer to provide support.

o Utilize communication and collaboration tool(s) provided by Cisco. If Customer uses non-Cisco provided collaboration tools for hosting meetings, managing documentation, instant messaging, desktop sharing, and collaborative spaces, provide Cisco with access.

• Customer will provide names of users who will have authorization to access these tools.

• Customer will support the implementation of software required to use tools in their environment.

o Data Collection Tools. Customer shall ensure that such Data Collection Tools or scripts are under lock and key and with access restricted to those Customer employee(s) or contractor(s) who have a need to access the Data Collection Tools and/or a need to know the contents of the output of Data Collection Tools. In the event Data Collection Tool provided by Cisco is Software, Customer agrees to make appropriate computers available and download Software as needed. Customer shall remain responsible for any damage to or loss or theft of the Data Collection Tools while in Customer's custody.

▪ Initial Set-up (One Time). If Cisco provides Data Collection Tools or scripts located at Customer's site, an initial set-up is required and the following must be performed:

- Complete the Data Collection Tools installation and system configuration questionnaire(s) (i.e. IP address, netmask, hostname, etc.) and return to the Advanced Services Engineer

- Install the Data Collection Tools hardware in a secure area with controlled physical access

- Connect the Data Collection Tools hardware to the Network
- Secure the Data Collection Tools behind Customer's corporate firewall
- Provide access to Data Collection Tools for use by Cisco to install, troubleshoot, and maintain; for remote access, SSH, Telnet, and/or dial are options, but virtual private network (VPN) access to the Graphical User Interface (GUI) is preferred and recommended
- When applicable, provide Data Collection Tools with HTTPS (SSL) access back to Cisco CCO/CCX servers located at nettools-upload.cisco.com; HTTP/FTP/PFTP may be used but Cisco strongly recommends HTTPS (SSL)
- When applicable, provide Data Collection Tools with SSH to the nettools-upload.cisco.com server to support the transfer of Data Collection Tools patches, security patches, and Rules Based Markup Language (RBML) update packages; FTP may be used but Cisco strongly recommends SSH
- Provide Data Collection Tools with SNMP and Command Line Interface (CLI) access to all Product(s) in the Network (necessary to facilitate collection of inventory and configuration information)
- Provide Data Collection Tools with the Network Product list in seedfile format containing SNMP Read Only (RO) community string and CLI (vty/enable or TACACS user-id / password) for access to all Product(s) in the Network (necessary to create the Data Collection Tools seedfile)
- Provide Syslog server and upload information

- Data Collection Tools Management (Ongoing). In the event Data Collection Tools are installed on Customer's Network, the following items must be performed on a regular or as needed basis to support the operation of Data Collection Tools in the Network:
- Notify Cisco about changes made to the Network such as Product(s) added/deleted and changes made to Product credentials
- Fix access problems (Access Control List's, firewall, etc.) which may periodically occur between Data Collection Tools and the Product(s) in the Network
- When applicable, fix data communication problems that prevent Data Collection Tools from uploading data to Cisco or prevent the remote maintenance of the Data Collection Tools
- Notify the Advanced Services Engineer when changes are made to Syslog, DNS, proxy and gateway servers IP address(es)

o Provide a Network topology map, configuration information, and information of new features being implemented as needed.

o Notify Advanced Services Engineer of any major Network changes (e.g., topology, configuration, new IOS releases.).

o In the event the Network composition is altered, after the Services selected under this Service Description have commenced, Customer is responsible to notify Cisco in writing within ten days (10) of the change. Cisco may require modifications to the fee if the Network composition has increased beyond the original pricing quote for Services.

o Create and manage an internal email alias for communication with Advanced Services Engineer.

o Retain overall responsibility for any business process impact and any process change implementations.

o Designate a program manager to act as the single point of contact to which all Cisco communications may be addressed, having an appropriate level of applications and Network experience. Such person shall act as Customer's host for onsite assessment activity to coordinate facility access, conference rooms, phone access and staff scheduling.

o Ensure key engineering, networking and operational personnel are available to participate in interview sessions as required by Cisco in support of an assessment. Review assessment report and suggestions provided by Cisco.

o Assessment data collection support.

o Customer agrees to make its production, and if applicable, test Network environment available for installation of Data Collection Tools. Customer shall ensure that Cisco has all relevant Product information needed for an assessment.

o Customer shall advise Cisco immediately of all adds, moves and changes of the Product within Customer's Network.

o Assemble all necessary Network availability data to enable Cisco to calculate quarterly Network availability. The type of data required to perform the calculations includes the following:

- Outage Start Time (date/time)
- Service Restore Time (date/time)
- Problem Description
- Root Cause
- Resolution
- Number of end users impacted
- Equipment Model
- Component/Part
- Planned maintenance activity/unplanned activity
- Total end user/ports on Network

o Provide the low-level design document describing how Customer's Network is or is planned to be built and engineered to meet Customer's specific set of

technical requirements and design goals. The low level design must provide a sufficient level of detail to be used as input to an implementation plan.

o   Ensure key detailed design stakeholders and decision-makers are available to participate during the course of the service.

o   Provide or extract additional information required in the design effort (e.g., current and planned traffic characteristics):

-   Any documentation of business requirements and technical requirements for the new design.
-   Any information on current and planned traffic characteristics or constraints. Documented information on all non-Cisco applications integrated through the Automation Software Tools including interface specifications as required
-   Information on current releases running in the Network and current configuration templates.
-   Information on Customer business and technical requirements for new Software releases.
-   Information on planned changes, new technology applications or major design changes (short term and long term), and contact information and Customer escalation process.
-   Information on Customer certification process and lab testing process.
-   Information on Customer change control process.
-   Information on any service level agreements or Network performance requirements.
-   Information on critical applications supported by the Network.
-   Information on which applications are mission-critical and their priority schemes.
-   Information on Customer's plans for business continuance, consolidation, and virtualization.
-   Information on expected Network growth and application mix changes.
-   Information on any future advanced technology implementations.
-   Information on architecture (which may include remote sites and size of remote sites).
-   Information on Customer implementation plans and/or deployment schedules.
-   Maintenance window information and any other constraints.

o   Support data collection activities as needed to facilitate a specific Cisco analysis.

o   Make remote console access available for Cisco staff members

o   Provide an environment for installation and operation of collection, monitoring and conversion tools if required

o   Provide up to four (4) weeks' notice of start of workshop for data gathering

o   Have available one Operating System, either: VMware ESX, RedHat Linux, Microsoft Server, SUSE Linux

o   Designate person(s) from within its technical support organization to serve as a liaison to the Advanced Services Engineer.

o   Provide its designated person(s) with instructions on process and procedure to engage the Advanced Services Engineer.

o   Identify low risk and high-risk areas of the Network based on their Network traffic.

o   Review details of planned changes with Advanced Services Engineer.

o   Advise Cisco of its standard operating procedures related to its business practices, its internal operational nomenclature and Network to allow Cisco to effectively communicate and discuss changes with Customer in the context of Customer's business environment.

o   Provide all necessary information to enable Cisco to summarize the root causes of issues identified.

o   Provide reasonable electronic access (remote and local) to Customer's Network to assist Cisco in providing support.

o   Collaborate with Cisco to determine appropriate and relevant topics

o   Provide a single point of contact to be used for all required communication and coordination of requested sessions

o   Ensure participation by Customer resources

o   Provide details in advance about the background and skill sets of each Remote Knowledge Transfer session audience

o   Provide facilities (such as: a room with projector, whiteboard and guest internet access) for Knowledge Transfer sessions.

o   Customer is solely responsible for the determination and successful implementation of its Network, design, business or other requirements.

o   This service shall be comprised of general technical assistance and shall be performed under Customer's direction and management and such assistance may

not result in some or all of the tasks being completed. Services are provided to the Customer in support of initiatives and activities described herein and Cisco shall not assume any cost or schedule liabilities.

o Provide Customer on-boarding information as follows: contact name, title, address, telephone number, e-mail address of primary and secondary team lead , Email ids and name of the Authorized Viewers who will need access to the "Portal".

o Install the Digital Rights Management ("DRM") software on as needed basis that allows to view the DRM-protected content on the Portal.

o Participate in training and/or feedback sessions with Cisco team to enable Cisco to understand the needs of the Authorized Viewers for the Portal.

o Notify Cisco of any technical support requests or troubleshooting issues related to the Services by sending an e-mail to Cisco team at tkl-support@cisco.com

o Provide necessary hardware, software and third party tools in the environment as specified in the CNOAS installation pre-requisite documentation.

o Provide documented information on Customer's existing CNOAS Infrastructure design including items such as: inventory of servers, network and configuration data.

o Provide documented information on all non-Cisco applications integrated through the Automation Software Tools including interface specifications as required

o Provide necessary hardware, software and third party tools in the environment as specified in the TES installation pre-requisite documentation.

o Provide documented information on Customer's existing TES Infrastructure design including items such as: inventory of servers and configuration data.

o Ensure key Customer personnel (such as: Cisco IAC Admin, CNOAS Admin, TES Admin, Database administrator, windows administrator, Unix/Linux administrator, network architecture and engineering, network operations staff, management tool lead) are available to participate during the course of the Service (to provide information, participate in the required activities and to participate in review sessions).

o Provide necessary hardware, software and third party tools in the environment as specified in the Cisco IAC installation pre-requisite documentation.

o Provide documented information on Customer's existing Cisco IAC Infrastructure design including items such as: inventory of servers, network and configuration data.

o Customer shall advise Cisco immediately of all adds, moves and changes of the Cisco IAC solution within Customer's environment.

o **Additional Customer Responsibilities associated with Validation-Test Cycle and Review**
• Provide the low level design document describing how Customer Network needs to be built and engineered to meet a specific set of technical requirements and design goals. The level of details must be sufficient to be used as input to an implementation plan.
• Ensure key detailed design stakeholders and decision-makers are available to participate during the course of the service.
• Provide or extract additional information required in the design effort (e.g., current and planned traffic characteristics).
• Information on Customer business and technical requirements for new Software releases.
• Review details of planned changes with Validation and Test Engineer.
• Information on Customer certification process and lab testing process.
• Information on Customer change control process.
• Information on any service level agreements or Network performance requirements.
• Information on critical applications supported by the Network.
• Information on which applications are mission-critical and their priority schemes.
• Information on Customer's plans for business continuance, consolidation, and virtualization.
• Information on expected Network growth and application mix changes.
• Information on any future advanced technology implementations.
• For Onsite Test Support, provide Cisco personnel with access during Standard Business Hours to appropriate Customer Lab facilities.

o **Assessment for Cloud Consumption Foundation Service.** In addition to the General Responsibilities, the follow specific responsibilities apply:

   o Review with Cisco the scheduling and agenda, including for the onsite project planning meeting.
   o Assign a single point of contact for the assessment project.

o Provide a list of all Customer stakeholders participating in the project planning meeting: project sponsor, director of applications or equivalent, director of networks or equivalent, Linux system administrator, and network administrator.
o Conduct inventory of known cloud services and complete the cloud usage questionnaire.
o Review with Cisco the inventory of known cloud services.
o Review with Cisco the network topology and determine the appropriate router (router must support NetFlow) for data collection.
o Work with Cisco to identify unknown cloud services.
o Review and validate unauthorized Cloud Service Providers
o Provide the data for the financial analysis (where Financial services are included in Assessment for Cloud Consumption Foundation Service)
o Review with Cisco the discovery methodology and associated data collection activities.
o Install the server and the Data Collection Tool instances.
o Set up the required hardware or virtual machine for the Data Collection Tool.
o Set up VPN or equivalent that will allow Cisco engineer to remotely access the data collector server.
o Configure the router(s) to send NetFlow (v.5/or v.9) data to the Data Collection Tool.
o Work with Cisco to verify that the data collection is operational from end-to-end.
o Respond to Cisco requests for system or router changes within one (1) week of the project planning meeting.
o Work with Cisco to schedule and confirm list of all attendees and stakeholders during final presentation at the onsite meeting.
o Review with Cisco the Cloud Consumption Optimization Report.
o Reconfigure routers to pre-project status.
o Reclaim server or VM used for Data Collection Tool
o Designate a single point of contact to act as the primary technical interface with the designated Cisco engineer.
o Provide documented Customer requirements (business and technical) and high-level network topology specifications.
o Provide documented information on Customer's existing infrastructure design including known cloud service providers, security policies and operational processes.
o Unless otherwise agreed to by the parties, Customer shall respond within two (2) Business Days of Cisco's request for any other documentation or information needed to provide the Service.
o Customer will create and manage an internal email alias for communication with the Cisco team.
o Customer will provide the required access to the network and required port connectivity for appliances and tools; and, Customer will provide the required IP addresses to connect the devices and the necessary DNS/NIS, Windows domain/Active directory configuration details.
o Customer acknowledges that completion of Services is dependent upon Cisco's use of Data Collection Tool.
o Customer will provide a Linux server or virtual machine to run Data Collection Tool for discovery of cloud services with following HW/SW requirements:

  ▪ CPU: 4-core Intel Xeon 3 GHz or better
  ▪ RAM: 8GB
  ▪ Disk: 2TB (dependent on network traffic)
  ▪ OS: CentOS 6. 4 or higher version
  ▪ Required access to cloud server: Port 8080

o Provide Cisco with a permission to utilize any Cisco or third-party software on the Network for the use of Data Collection Tool, network inventory and performance data gathering.
o Customer is responsible to implement system change requests (firewall, ACL configuration, user-id creation, etc.) to facilitate data gathering within one (1) business day of the initial request.
o Customer agrees to make appropriate computers available and agrees to allow Cisco to install Data Collection Tool software as needed.
o All information (such as but not limited to: designs, topologies, requirements) provided by Customer is assumed to be up-to-date and valid for the Customer's current environment. Cisco Services are based upon information provided to Cisco by Customer at the time of the Services.
o Customer acknowledges that the completion of Services is dependent upon Customer meeting its responsibilities as indicated herein.
o Identify Customer's personnel and define their roles in the participation of the Services. Such personnel may include but is not limited to: architecture design and planning engineers, and network engineers.

- o Ensure Customer's personnel are available to participate during the course of the Services to provide information and to participate in scheduled information gathering sessions, interviews, meetings and conference calls.
  - o Support services provided by Cisco comprise technical advice, assistance and guidance only.
- o **Security Assessment for Secure Cloud & DC Network Devices.** In addition to the General Responsibilities, the follow specific responsibilities apply:
  - o List of up to 350 devices to be included in
  - o assessment,
  - o Supply device configurations and versions, and,
  - o Supply relevant network topology diagrams.
- o **Data Center Security Posture Assessment (SPA).** In addition to the General Responsibilities, the follow specific responsibilities apply:
  - • Internal Security Posture Assessment
    - o Supply Cisco with a work location with network connectivity to the internal network, and,
    - o Supply list of internal IP ranges to include in Assessment.
  - • Perimeter Security Posture Assessment
    - o Supply list of externally accessible IP addresses to be included in Assessment, and,
    - o Support data collection activities as required to support specific Cisco analyses.
- o **Security Assessment for Secure Cloud & DC**. In addition to the General Responsibilities, the follow specific responsibilities apply:
  - • Provide access to the appropriate resources with knowledge and authority to provide Cisco with the following information:
    - • Key business critical assets,
    - • Assess specific threats to identified business critical assets,
    - • Physical and logical network topology diagrams, including the location of the devices included in assessment,
    Network architecture description,
    - • Security policies, standards and procedures,
    - • Services that traverse the perimeter network,
    - • Applications and services running over the network (VoIP, video streaming, terminal emulation, http, ftp, etc.),
    - • High-level architecture of data center, internal servers, user host connectivity and Internet connectivity,
    - • Network Management System architecture, and,
    - • Empirical data necessary to develop Cisco Security Control Framework metrics.
- o **Security Strategy Planning Support for Secure Cloud & DC.** In addition to the General

Responsibilities, the follow specific responsibilities apply:
- o Establish and inform Cisco of dates at least sixty (60) days in advance of strategic planning meetings.
- o Provide technology roadmaps necessary to support the planning sessions.
- o Provide information on any current and planned traffic characteristics or constraints.

- o **Day 2 Custom Workflow Support Service for Cisco IAC, OpenStack and ACI.** In addition to the General Responsibilities, the follow specific responsibilities apply:

  - o Designate at least one (1) but not more than six (6) technical representatives to act as the primary technical interface to the Cisco Engineer per support request. Representatives must be Customer's employees in a centralized location. Customer will designate as contacts senior engineers, stakeholders, and decision-makers to participate with the authority to make any necessary changes to the Cisco IAC workflow. One individual, who is a senior member of management or technical staff, will be designated as Customer's primary point of contact to manage the implementation of services under this Service Description (e.g. assist with prioritization activities). Provide its designated person(s) with instructions on process and procedure to engage the Cisco Engineer.
  - o Ensure key Customer personnel (such as: architecture design and planning, network engineering, network operations staff) are available to participate during the course of the Service (to provide information and to participate in review sessions).
  - o Provide reasonable electronic access to Customer's Environment to allow the Cisco Engineer to provide support.
  - o Provide Customer internal governance and escalation process and contact information.
  - o Provide documented information on Customer's existing Cisco IAC workflow.
  - o Provide information about Customer device and Cisco IAC workflow lab testing and certification process(es).
  - o Provide information about any service level agreements or performance requirements.
  - o Provide information about critical applications supported by the Cisco IAC workflow.
  - o Provide periodic information about changes planned for the Cisco IAC Workflow regarding new technology, applications, or

major design changes (short term and long term).

o Unless otherwise agreed to by the parties, Customer shall respond within two (2) Business Days of Cisco's request for any other documentation or information needed to provide the Service.

o Create and manage an internal email alias for communication with Advances Services Engineer & delivery team.

o Utilize communication and collaboration tool(s) provided by Cisco.

o The following is required for Customer's use of Collaboration Tools:

  i. Customer will provide the names and other pertinent information (such as e-mail account information) of Customer resources who require authorization to access;

  ii. Customer will support the implementation of software required to use the Collaboration Tools in their environment;

  iii. Customer will download Collaboration Tools guest client(s), if applicable, if not already in possession of the applicable license; and

  iv. Customer agrees to immediately return Collaboration Tool(s) to Cisco, as instructed by Cisco, upon the earlier of:
  Completion of Services; or
  Cisco's request to Customer that the Collaboration Tool(s) be returned to Cisco.

o If Customer uses non-Cisco provided collaboration tools for hosting meetings, managing documentation, instant messaging, desktop sharing, and collaborative spaces, provide Cisco with access.

  o Customer will provide names of users who will have authorization to access these tools.

  o Customer will support the implementation of software required to use tools in their environment.

o Retain overall responsibility for any business process impact and any process change implementations.

o Provide list of Cisco.com Customer USERIDs to be entitled as required to enable access by Customer to any Customer-accessible portal or online component throughout service contract duration.

o Data Collection Tools. Customer shall ensure that such Cisco provided Data Collection Tools or scripts are under lock and key and with access restricted to those Customer employee(s) or contractor(s) who have a need to access the Data Collection

Tools and/or a need to know the contents of the output of Data Collection Tools. In the event Data Collection Tool provided by Cisco is Software, Customer agrees to make appropriate computers available and download Software as needed. Customer shall remain responsible for any damage to or loss or theft of the Data Collection Tools while in Customer's custody.

o Initial Set-up (One Time). If Cisco provides Data Collection Tools or scripts located at Customer's site, an initial set-up is required and the following must be performed:

  o Customer should complete the Data Collection Tools installation and system configuration questionnaire(s) (i.e. IP address, netmask, hostname, etc.) and provide access to the tool to the Cisco Engineer. Install the Data Collection Tools hardware in a secure area with controlled physical access

  o Connect the Data Collection Tools hardware to the Network

  o Secure the Data Collection Tools behind Customer's corporate firewall Page

  o Provide access to Data Collection Tools for use by Cisco to install, troubleshoot, and maintain; for remote access, SSH, Telnet, and/or dial are options, but virtual private network (VPN) access to the Graphical User Interface (GUI) is preferred and recommended

  o When applicable, provide Data Collection Tools with HTTPS (SSL) access back to Cisco servers; HTTP/FTP/PFTP may be used but Cisco strongly recommends HTTPS (SSL)

  o When applicable, provide Data Collection Tools with SSH to support the transfer of Data Collection Tools patches, security patches, and Rules Based Markup Language (RBML) update packages; FTP may be used but Cisco strongly recommends SSH

  o Provide Data Collection Tools with SNMP and Command Line Interface (CLI) access to all Product(s) in the Network (necessary to facilitate collection of inventory and configuration information)

  o Provide Data Collection Tools with the Network Product list in seed file format containing SNMP Read Only (RO) community string and CLI (vty/enable or TACACS user-id / password) for access to all Product(s) in the Network (necessary to create the Data Collection Tools seed file)

- o Provide Syslog server and upload information
- o Data Collection Tools Management. In the event Data Collection Tools are installed on Customer's Network to resolve an issue, the following items must be performed on a regular or as needed basis to support the operation of Data Collection Tools in the Network:
  - o Notify Cisco about changes made to the Network such as Product(s) added/deleted and changes made to Product credentials
  - o Fix access problems (Access Control Lists, firewall, etc.) which may periodically occur between Data Collection Tools and the Product(s) in the Network
  - o When applicable, fix data communication problems which prevent Data Collection Tools from uploading data to Cisco or prevent the remote maintenance of the Data Collection Tools
  - o Notify the Cisco Engineer when changes are made to Syslog, DNS, proxy and gateway servers IP address(es).
- o Customer acknowledges that Cisco's obligation is to only provide assistance to Customer with respect to the Cisco IAC custom workflow and that such assistance may not result in some or all of the other tasks such as change management, design reviews, etc being worked on by the Customer.
- o Customer should contact the Cisco TAC for any kind of Cisco IAC solution support. Here Cisco IAC product specific problem support is provided by the Cisco TAC organization as part of Software Application Service plus Upgrade SASU service contract. SASU service contract is separate from this service contract. Cisco engineer would engage as part of this service contract only in the situation where it is clearly identified by Cisco TAC engineer that problem is related to custom workflow developed by Cisco.
- o It is understood by the Customer that once Cisco TAC identifies issue related to custom work, Cisco engineer would be engaged within appropriate response time to start assessing and understanding the problem to resolve it. As Cisco IAC Day 2 reactive support service is to resolve custom workflow issues, it requires investigation before assessing any resolution time.
- o Provide information about current Cisco IAC Solution environment to Cisco Engineer engaged to resolve the problem as soon as

possible. Information could include all existing documentation for the implemented solution such as customer requirement document (CRD), high level design (HLD), low level design (LLD), test plan, change request documents, knowledge transfer documents, etc. Ensure key Customer staff is available for scheduled information gathering sessions such as interviews or data capture of the production environment. Any delay in providing information requested to Cisco, may lead to delay in resolving the problem and Cisco is not responsible for such delays.
- o Make available access to Customer Site, remote or onsite as necessary for Cisco to perform the Services.
- o Designate a backup contact when Customer contact is unavailable. This person has the authority to act on all aspects of the work being performed in absence of the primary contact.
- o Customer will be responsible for arranging required support for Cisco team from third party vendor; which may be in form of Knowledge Transfer KT for system functionality, API/Commands/Scripts for requested support.
- o Work with Cisco to provide all required information and coordinate with departments as appropriate to resolve the problem. If deployed workflow includes any third party solution then Cisco may need access to such third party solution for troubleshooting and/or testing. If Customer cannot provide access to such third party solution then troubleshooting and/or testing of such workflow would be responsibilities of Customer. This is a critical step to resolve the problem.
- o It is expected that Customer or their representative partners have not made any changes to the Cisco IAC workflow that was designed and developed by Cisco and successfully put in production environment when they call for Day 2 reactive support. Otherwise, Customer shall be responsible for extra costs relating to time for Cisco personnel to assess and understand the changes in the Cisco IAC workflow in customer environment. Cisco shall not have any liability for any costs, which may occur due to project delays due to such assessment.
- o Provide resource who can understand English language as all services will be provided in the English language unless otherwise agreed to by Customer and Cisco.
- o Customer would provide the solution Verification Test Plan to Cisco so Cisco can

use it to test the portion of it to verify resolution of the problem.

o Work with Cisco to test the resolution against Verification Test Plan. It is understood that such Validation Test Plan may not cover full scale testing for all feature, functionality and performance of the entire solution and it would be Customer's responsibility to test it for appropriate production usage.

o Assign and schedule resources to attend the transfer of knowledge session.

o It is understood that if Cisco Engineer identifies that problem involves third party software as part of AS delivered solution then Cisco can assist the Customer in communicating the problem to the third party vendor and facilitating any required follow-up with the third party but it would be Customer's responsibility to coordinate such activities between Cisco and 3rd party and Customer shall have appropriate relationship with the 3rd party to get the required support. Cisco shall not have any liability for any costs, which may occur due to 3rd party delays to work on resolving such issue.

o Customer shall provide, at no charge to Cisco, reasonable access to the Cisco IAC custom solution through a secure method such as VPN or other tunneling encryption, as determined by Cisco to be required in accordance with Cisco's remote access procedures in order to establish a data communication link between Customer and Cisco, such that problems may be diagnosed and corrected remotely. Customer also agrees to make available to Cisco current system passwords as necessary to provide such remote diagnosis and support.

o Customer is responsible for any Hardware and Software required performing fault isolation or to recreate the problem in the Cisco's lab environment.

o Customer acknowledges that it is only entitled to receive Services on Cisco IAC Custom Workflow Day 2 Support for which it has paid the applicable software license and SASU support fee when purchasing Services for such Cisco IAC Day 2 Support. Cisco reserves the right, upon reasonable advance notice, to perform an audit of Customer's Cisco IAC Solution Software and records to validate such entitlement and to charge for support if Cisco determines that unauthorized support is being provided, as well as interest at the highest rate permitted by law, and applicable fees including, without limitation, attorneys' fees and audit fees.

o Upon opening a case with Cisco TAC Team related to Cisco IAC Product Support,

Customer is required to provide Cisco the Service contract number for the SASU for which Cisco is providing service and support. In the event that Customer is unable to provide valid and applicable Contract number for the SASU and Cisco agrees to provide Services then fees payable by Customer shall be at Cisco's then-current time and materials or non-contract service rates.

o Upon opening a case with Cisco TAC Team related to Cisco IAC Day 2 Support, Customer is required to provide Cisco the Service contract number for the SASU for which Cisco is providing service and support. Cisco will validate SASU contract and validity of Cisco IAC Day 2 Support engagement. In the event that Customer is unable to provide valid and applicable Contract number for the SASU or current Cisco IAC Day 2 Support engagement and Cisco agrees to provide Services then fees payable by Customer shall be at Cisco's then-current time and materials or non-contract service rates.

Customer will provide appropriately qualified staff to work with the Cisco's engineers for Cisco IAC Support.

o Customer agrees to provide Cisco with sufficient information to attempt to resolve the issue. Customer shall provide such information as a brief description of the issue being reported, issue classification, date upon which the issue was first encountered, date the issue is being reported, manner in which the issue was isolated and reproduced, and, if available, provide the test program that exhibits the issue.

o Customer will provide an internal escalation process to facilitate communication between management levels in Cisco and Customer as appropriate, including personnel contact list.

o Customer will provide Cisco feedback on any Cisco IAC Custom Workflow workaround and potential fixes, which may be incorporated into the Cisco IAC Custom Workflow at Cisco's sole discretion.

o Customer will provide Cisco access to Customer developed software as needed to resolve Cisco IAC Custom Workflow Cases reported by Customer.

o Upon mutual agreement of the parties, Customer will facilitate access to Customer software or affected Customer Products such that problems may be diagnosed remotely via the Internet or via modem access.

o Customer may log, monitor, and update Cases electronically via Cisco.com.

o Unless otherwise agreed and stated herein provision of test equipment is the responsibility of the Customer

o Customer is responsible for determination and implementation of Customer's network design requirements and implementation of any recommendations provided by Cisco. Cisco recommendations are based upon information provided to Cisco at the time of the services. In no event shall Cisco be liable for the accuracy or completeness of the information contained in the Cisco recommendations.

o All Documentation Deliverables will be provided in the English language. Any costs incurred by Cisco as a result of translations requested by Customer shall be Customer's responsibility and managed through the Change Management Procedures. In the event of any conflict between this English version and the translation(s), the English version will prevail.

o It is understood that Cisco reserves the right to subcontract Services to a third party organization to provide Services to Customer.

o For the options where travel is included in the price of the contract, it is understood that maximum twelve (12) trips related labor and travel expenses are included. Customer will reimburse Cisco for all labor and travel expenses beyond twelve (12) trips at Cisco's then-current time and material rates when it is mutually agreed that Cisco on-site technical resources are required for resolution and Cisco dispatches the necessary level of technical support to assist Customer. Cisco reserves the right to charge for travel time.

o Customer is responsible for determination of its requirements, and that Customer shall retain overall responsibility for any business process impact and any process change implementations.

o Customer acknowledges that completion of Services is dependent upon Customer meeting its responsibilities as identified in this service contract.

o All Services will be provided remotely from Cisco to Customer locations, unless otherwise agreed in writing by Cisco.

o Supported Cisco Products and technologies for this service contract are Cisco IAC solutions only. Supported Products exclude

any other break-fix support for custom solutions such as third party applications, Cisco Network Operations Automation or Application Workload Automation solutions and any Products declared to be "End of Support.

o Cisco IAC product specific problem support is provided by the Cisco TAC organization as part of SASU service contract. Cisco engineer would engage only in the situation where it is clearly identified by Cisco TAC that problem is related to the custom workflow.

o Any customization, upgrade, porting of the Cisco IAC Workflow, or labor to install the Cisco IAC Workflow. Such services may be provided under a separate contract or deliverables such as:

o Support of any changes made by Customer or designated partner to the Cisco IAC Workflow put in production by Cisco

o Support of Cisco IAC Workflow problems that are diagnosed by Cisco to be Enhancement requests or changes by Customer to the workflow for which the Cisco IAC Workflow was developed. Resolution of the problems is viewed by Cisco as an Enhancement for which a separate statement of work between the parties is required.

o Any Hardware or third party product that Customer may need to acquire that is related to this service contract

o Support or replacement of Cisco IAC workflow that are altered, modified, mishandled, destroyed or damaged by natural causes or damaged due to a negligent or willful act or omission by Customer other than as specified in the applicable Cisco-supplied documentation.

o Services to resolve Product or Cisco IAC Workflow problems resulting from third party products or causes beyond Cisco's control or Customer's failure to perform its responsibilities under this service contract.

o Any support, upgrade or maintenance for Product other than Cisco IAC Workflow as defined in this service contract.

- o Services for non-Cisco development tools or any non-Cisco software installed in the Product.

- o Any Hardware upgrade required to run new or updated Cisco IAC Workflow.

o Customer acknowledges that it is only entitled to receive support services against the Support Option for which it has paid a separate support fee. In the event additional Cases or Custom Applications are supported by Cisco beyond that which Customer has ordered, Cisco reserves the right to charge for support if Cisco determines that unauthorized support is being provided.

o Customer acknowledges that it is not entitled to support on Cisco products not covered Support for Cisco products is covered under separate service maintenance agreements.

o Additional Support Options that are not scoped as part of this service contract as follows:

- o On-Site Emergency Support. As a result of a critical situation, Customer may request on-site emergency support as a separate and distinct billable service, the fee for which shall represent Cisco's then current pricing. On-site emergency support is at the discretion of Cisco and is subject to Cisco resource availability, and the tasks performed will vary based on the situation, environment, and business impact of the problem.

- o Additional Feature Functionality. As a result of a changed Customer requirements, Customer may request additional feature implementation as part of providing such problem resolution as a separate and distinct billable service, the fee for which shall represent Cisco's then current pricing. Implementation of such support is at the discretion of Cisco and is subject to Cisco resource availability, and the tasks performed will vary based on the situation, environment, and business impact of the problem.

- o Training classes for Cisco to provide Customer with foundational knowledge of Cisco IAC Solution. Pricing for such training shall be at the then current published Cisco pricing separate from this service contract.

- o **Cloud Onboarding Automation Factory.** In addition to the General Responsibilities, the follow specific responsibilities apply:

  - o Execute the workload migrations via use of the Cisco cloud onboarding automated migration as a service tool.

  - o Install (if required) converted workloads into the target environment and troubleshooting any installation and instantiation (getting started) issues

  - o Ensure provision of valid software licenses for workload operation in the target environment

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Supplemental Glossary of Terms for Data Center Optimization Services

· **"Authorized Viewer/s"** means either (i) an employee of Customer or (ii) an independent contractor of Customer performing services for Customer's benefit who is authorized by Customer to use the Services for "Internal Use Purposes".

· **"Content"** means the content hosted on the Portal as part of the services, including the Sidebar content. All Content shall be considered Cisco Confidential Information.

· **"Internal Use Purposes"** means use of the Services for the sole purpose of permitting Authorized Viewers to view the Content, provided that all such viewing is solely intended for furthering the Customer's internal communications, training, education or administrative objectives. Notwithstanding anything to the contrary in this Service Description, "Internal use Purposes" expressly excludes (i) the licensing, copying, transferring, or distributing of any element of the Services; (ii) displaying of any element of the Content to any person other than Authorized Viewers, and Customers will not permit or enable any other persons to view any element of the Content; (iii) modifying, altering, abbreviating, or editing of any element of the Services unless expressly permitted by Cisco or its suppliers or licensors; (iv) the incorporation of any element of the Services into any product or service of Customer or creating a derivative work based upon the Services, and (v) using any element of the Services in a any manner other than as expressly authorized under this Service Description.

Acronyms

- · ACE – Application Control Engine
- · ACNS- Application and Content Networking System
- · ADM – Anomaly Detector Module
- · ASA – Advanced Service Agreement
- · AXG – Application Exchange Gateway

- CIAC – Cisco Intelligent Automation for Cloud
- CNOAS – Cisco Network Operation Automation Service
- CPO – Cisco Process Orchestrator
- CRD – Customer Requirements Document
- CSS – Content Service Switch
- DB – DataBase
- DC – Data Center
- DCAF – Data Center Analytics Framework
- DCDSA – Data Center Device Security Assessment
- DMM – Data Mobility Manager
- DMZ – DeMilitarized Zone
- DNS Domain Name Server
- DR – Disaster Recovery
- DRM – Digital Rights Management
- DWDM – Dense Wave Division Multiplexing
- EaaS – Energy as a service
- eCDS – Enterprise Content Delivery System
- EOS – Energy Optimization Service
- EOS – Energy Optimization Service
- FCIP – Fiber Channel over IP
- FCoE – Fiber Channel over Ethernet
- FICON – Fiber Connection
- FWSM – Firewall Services Module
- GSS – Global Site Selector
- CSM – Content Switching Module
- GUI – Graphical User Interface
- IA – Intelligent Automation
- IaaS – Infrastructure as a Service

- IOA – I/O Accelerator
- IPL Files Initial Program Load Files
- ISR – Integrated Service Routers
- LVM – Landscape Visualization Management
- MDE – Media Delivery Engine
- MDS – Multilayer Data Switch
- MKS – Modular Knowledge Service
- MSA – Master Services Agreement
- OTV – Overlay Transport Virtualization
- QBR – Quarterly Business Review
- SAN – Storage Area Network
- SCF – Security Control Framework
- SLB – Server Load Balancing
- SSLM - SSL Module
- TCO – Total Cost of Ownership
- TES – Tidal Enterprise scheduler Environment
- UAT – User Acceptance Test
- UCS – Unified Computing System
- UNS – Unified Network Services
- VEM – Virtual Ethernet Modules
- VPC – Virtual Port Channel
- VPN – Virtual Private Network
- VSAN – Virtual Storage Area Network
- vWAAS – Virtualized Wide Area Application Services
- WAAS – Wide Area Application Services
- WAE – Wide Area Application Engine
- WAVE – Wide Area Virtualization Engine

Appendix A

Service SKUs

The following list of service SKUs/Tags is provided for reference:

Data Center Optimization - General Support

Data Center Improvement Plan (DCN-OPT GS NIP)
Ongoing Design support (DCN-OPT GS ODS)
Ongoing Software support (DCN-OPT GS OSS)
Ongoing Service and Project Management Support (DCN-OPT GS OSPMS)
Quarterly Business Review (DCN-OPT GS QBR)
Proactive Software Recommendation Report (DCN-OPT GS PSRR)
Remote Knowledge Transfer Sessions (DCN-OPT GS KTM)
Scheduled Change Support (DCN-OPT GS SCS)
Test Plan Review (DCN-OPT GS TPR)
Validation and test cycle standard (DCN-OPT GS VT)

Data Center Strategy and Architecture Service

Data Center Virtualization Architecture Assessment (DCN-OPT E2E DCAVA)
Data Center Virtualization Design Review (DCN-OPT E2E VNDR)
Application Migration Planning Review (DCN-OPT E2E AMPR)
Architecture Value Analysis (DCN-OPT E2E AVA)
Architecture Acceleration Assessment (DCN-OPT E2E AAA)
IPv6 Architecture and Design Review (DCN-OPT E2E IADR)
IPv6 Device Assessment (DCN-OPT E2E IDR)
Security Assessment for Secure Cloud and & DC Network Devices (DCN-OPT E2E NDSA)
Security Strategy Planning Support for Secure Cloud and DC (DCN-OPT E2E SSP)
Security Assessment for Secure Cloud and DC (DCN-OPT E2E SDA)
Data Center Security Posture Assessment (DCN-OPT E2E SPA)
On Site Residency (DCN-OPT E2E RESIDENT)

Cloud Optimization

Cloud Technology Architecture Assessment (DCN-OPT CLOUD TAA)
Cloud Management Automation Assessment (DCN-OPT CLOUD MAA)

Desktop Virtualization Optimization

Desktop Virtualization Systems Assessment (DCN-OPT DV SA)
Desktop Virtualization Architecture Review (DCN-OPT DV AR)
Desktop Virtualization Operations Audit (DCN-OPT DV OA)
Ongoing Desktop Virtualization Design Support (DCN-OPT DV ODS)

Data Center Unified Computing Optimization

UCS Architecture Assessment (DCN-OPT UCS NA)
UCS Configuration and Performance Audit (DCN-OPT UCS CPA)
UCS Disaster Recovery Review (DCN-OPT UCS DRR)
UCS Leading Practices Audit (DCN-OPT UCS LPA)
Application Dependency Mapping (DCN-OPT UCS ADM)
Onsite Unified Computing Consulting Support (DCN-OPT UCS OES)
UCS Health Check (DCN-OPT UCS HC)
Nexus1000v Health Check (DCN-OPT UCS N-1000HC)

UCS Operational Enhancement Assessment (DCN-OPT UCS OEA)
UCS System Integration Support (DCN-OPT UCS SIS)

UCS SAP HANNA Heath Check (DCN-OPT UCS NS)
UCS Application Workshop (DCN-OPT UCS NS)

Data Center Unified Networking (ACE, WAAS) Services Optimization

UNS Network Assessment (DCN-OPT ACE NA, DCN-OPT WAAS NA)
UNS Architecture Review (DCN-OPT ACE DDR, DCN-OPT WAAS DDR)
Application Security Assessment (DCN-OPT ACE ASA)
CSS/CSM/SSLM to ACE migration report (DCN-OPT ACE MR)
Ongoing WAAS Mobil support (DCN-OPT WAAS MDS)
ACNS to eCDS migration support ((DCN-OPT WAAS MR))
WAAS Configuration Audit (DCN-OPT WAAS CA)
WAAS Health Check (DCN-OPT WAAS HC)

Data Center Unified Fabric (Nexus) Optimization

Nexus Network Assessment (DCN-OPT DC3 NA)
Nexus Architecture Review (DCN-OPT DC3 DDR)
Nexus Advanced Feature Assessment (DCN-OPT DC3 AFA)
Nexus Fiber Channel over Ethernet ("FCoE") Support (DCN-OPT DC3 FCOE)
Nexus security assessment (DCN-OPT DC3 SA)
Nexus Business Continuance Review (DCN-OPT DC3 BCR)
Nexus Advanced Feature Assessment (DCN-OPT-DC3 AFA)
Nexus Virtualization Design Review (DCN-OPT DC3 VDR)
Nexus Health Check (DCN-OPT DC3 HC)
Onsite Nexus Consulting Support (EMEAR and APAC) (DCN-OPT DC3 OES)

SAN Optimization Services

SAN Assessment (DCN-OPT SAN NA)
SAN Architecture Review (DCN-OPT SAN DDR)
Test Plan Review (DCN-OPT SAN TPR)
SAN Health Check (DCN-OPT SAN HC)
Storage Capacity & Impact Analysis (DCN-OPT SAN SCA)
Data Migration (DCN-OPT SAN DM)
FCoE Support (DCN-OPT SAN FCOE)
FICON Support (DCN-OPT SAN FICON)
SAN Management & Monitoring (DCN-OPT SAN SMM)
SAN Extension (FCIP, DWDM, IOA) (DCN-OPT SANEXT)
SAN Assessment Service for Brocade displacement (DCN-OPT SAN NABRCD)

Cisco Data Center Modular Knowledge Service (DCN-OPT E2E DCMKS, DCN-OPT CLOUD DCMKS, DCN-OPT DV DCMKS, DCN-OPT ACE DCMKS, DCN-OPT WAAS DCMKS, DCN-OPT UCS DCMKS, DCN-OPT SAN DCMKS, DCN-OPT DC3 DCMKS)

Cisco Data Services for Operations Enablement

Operations Audit (DCN-OPT DCSOE ORMA)
Management Solution Architecture Review (DCN-OPT DCSOE DCMA)
Operations Support Planning (DCN-OPT DCSOE OSPS)
Instrumentation Audit (DCN-OPT DCSOE INSTR)
Data Center Resiliency Analysis (DCN-OPT DCSOE DCRA)
Management Software upgrade Support (Minor and Major) (DCN-OPT DCSOE MINSWUP, DCN-OPT DCSOE MAJSWUP)
Operational process or runbook update (DCN-OPT DCSOE SOPRB)
ITSM Residency (DCN-OPT DCSOE RESIDENT)

Cisco Data Center Intelligent Automation Services

Upgrade Assessment and Support (DCN-OPT CIAS UA)
Site and Systems Administration Support (DCN-OPT CIAS SAA)Ongoing Support (DCN-OPT CIAS OES)

Cisco Intelligent Automation for Cloud

Upgrade Assessment and Support (DCN-OPT CIAC UA)
Site and Systems Administration Support (DCN-OPT CIAC SAA)
Day 2 Custom Workflow Support (DCN-OPT D2RCSS CIAC)
Ongoing Support (DCN-OPT CIAC OES)

Cisco Network Operations Automation Services

Workshop (DCN-OPT CNOAS WS)
Upgrade Assessment and Support (DCN-OPT CNOAS UA)
Site and Systems Administration Support (DCN-OPT CNOAS SAA)
Ongoing Support (DCN-OPT CNOAS OES)
Custom Design Day 2 Reactive Support (DCN-OPT CNOAS CDRS)
Prepare & Present QBR (DCN-OPT CNOAS QBR)

Cisco Workload Automation Services

Assessment (DCN-OPT AWAS AA)
Upgrade Assessment and Support (DCN-OPT AWAS UA)
Site and Systems Administration Support (DCN-OPT AWAS SAA)
Ongoing Support (DCN-OPT AWAS OES)
Custom Design Day 2 Reactive Support (DCN-OPT AWAS CDRS)

Connected Grid Energy Optimization Service ("EOS")

Discovery and Information Gathering (DCN-OPT CGEOS NA DIG)
Energy Management Assessment (DCN-OPT CGEOS NA EMA)
Energy Management Support and Knowledge Transfer (DCN-OPT CGEOS NA EMSKT)

Data Virtualization Optimization

Data Virtualization Architecture Review (DCN-OPT DVS DDR)
Data Virtualization Site and Systems Administration Support (DCN-OPT DVS SAA)
Data Center Virtualization Health Check (DCN-OPT DVS HC)
Upgrade Assessment/Support (DCN-OPT DVS UA)
Onsite Residency (DCN-OPT DVS RESIDENT)

Cloud Onboarding Automation Factory

Ongoing Service and Project Management (DC-OPT COB PM)
Knowledge Transfer (DC-OPT COB KTM)
Usage of Automated Workload Migration Toolset (DC-OPT COB AWM)
Ongoing Tool Support (DC-OPT COB OES)
Migration Support (DC-OPT COB MGS)
Systems Integration Support (DC-OPT COB SIS

OpenStack Optimization Services

Day 2 Custom Workflow Support (DCN-OPT D2RCSS OS)

Application Centric Infrastructure (ACI) Optimization Services

Custom Workflow Support (DCN-OPT D2RCSS AII)

SAP HANA Optimization

SAP HANA Optimization (DCN-OPT SAP HANA)