Broadcaster Increases Programming Without Increasing Costs

DR uses a multiservice network as the platform for digital editing, intercom, telephony, and more.

EXECUTIVE SUMMARY
DR, DANISH BROADCASTING CORPORATION • Broadcasting • Copenhagen, Denmark • 3346 employees
CHALLENGE • Compete successfully with global media companies • Increase programming without increasing costs • Increase productivity
SOLUTION • Consolidated multiple specialized networks into a single IP-based network • Shared digital content among television, radio, and web programs
RESULTS • Doubled number of programs without increasing budget • Remained country's most popular television and radio station even after workforce reduction

Challenge

DR, formerly Danmarks Radio, is Denmark's national broadcaster. As a not-for-profit organization, its goal is to serve the public by providing news, information, and entertainment. Established in 1925, the broadcaster today operates 4 nationwide and 11 regional FM radio stations, 15 Digital Audio Broadcast (DAB) stations, 27 web radio stations, 2 television channels, and a website (www.dr.dk/tv) that viewers can visit to watch streaming TV on their PCs or smartphones.

"In 2000, we began looking for a way to increase the quantity and quality of our programming, improve productivity, and publish media on more platforms, but without increasing the budget," says Michael Kaaber Harrit, chief strategy officer, DR. The broadcaster has a fixed budget based on the yearly US$400 license fee paid by each citizen who has a television or radio. "To do more with less, we knew we needed to look to technology," says Harrit.

To achieve its goals, the DR IT group decided to adopt an all-digital workflow for recording, editing, producing, and broadcasting all types of content. The broadcaster had adopted a digital format for its radio programs in 1995 and its news and sports television programs in 2000 and now wanted to use it for all other programs, as well. A digital workflow would lower capital and operational costs by enabling the broadcaster to replace its multiple specialized networks with a single, reliable IP network that worked alongside a serial digital interface (SDI) and Audio Engineering Society and European Broadcasting Union (AES/EBU) routing system for transporting live video and audio. The digital workflow would also enable DR to repurpose the same content for different media. That is, rather than assigning separate TV, radio, and web journalists to cover the same story, the broadcaster would be able to assign one journalist, store the content in digital format, and then customize the content as appropriate for the delivery channel.

The opportunity to adopt a digital workflow arrived when DR began planning a 132,000-square-meter, all-digital multimedia broadcasting house in Copenhagen. The building, known as DR Byen (Media City), would consolidate the 12 facilities previously used for radio, television, and web broadcasting and a concert hall. The broadcaster decided to outfit the facility with an IP network that would replace previously separate networks for radio and television recording studios,

telephony, intercom (used when someone needs to talk to the studio), mixing consoles, and lighting control. “A single, multiservice IP network for the building would support our transformation from disparate entities for radio, television, and web into a coherent media production organization, with substantial cost savings as a result,” says Harrit.

Some DR managers and executives hesitated to put all services on one network because the industry is more accustomed to using networks designed specifically for each function. “We explained that if we wanted to share content, a goal that everyone supported, we needed an IP network because IP is the only technology that can tie all systems together,” Harrit says. “In our vision, the network would be the platform for storytelling.”

Solution

As a government-supported organization, DR must follow strict rules for vendor selection. To select a network infrastructure, DR evaluated solutions from leading vendors by assigning weighted scores to criteria that included:

- Resilience: “Going off air for a few seconds is catastrophic in radio and television broadcasting because you lose all your viewers,” says Harrit.
- Security: DR needed to prevent unauthorized access to the network that could interfere with programming.
- Capacity: Not only would DR need to provide enough bandwidth for more than 400 clients, it would need to accommodate the bursty traffic from the video-editing servers.
- Low total cost of ownership: Factors include capital cost as well as ease of management.
- Project management: This included planning, implementation, maintenance, and support.

Cisco most closely met the requirements, and DR began working with Cisco in 2003 to build a three-tiered network, including access, distribution, and core, for its headquarters building. The network is the platform for all applications that DR employees use for content production, content editing, broadcast, telephony, and wireless access. The network is designed for resilience. “If any switch becomes unavailable, traffic can find a way around it,” Harrit says.

IP Telephony

In the new DR building, telephony is an application on the IP network, just like any other application. DR uses Cisco® Unified Communications Manager for IP telephony. The Cisco Unified Communications solution provides the reliability and quality that DR needs for internal calls and listeners’ calls to live radio shows, the latter in conjunction with third-party systems.

Wireless Network

When video editors work on high-resolution (high-res) files, they can use any wired desktop in the building, all of which provide a 1-Gbps connection. If they want to work wirelessly, they can edit low-resolution (low-res) files, which require less bandwidth to access. The resulting Edit Decision Lists (EDL), which contain text only, not the actual video, provide the instructions applied to the high-res video.

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>
> **—Michael Kaaber Harrit, Chief Strategy Officer, DR Technology**

Results

The all-digital workflow and consolidated facility, which facilitates content sharing, have helped DR increase content quantity and quality. Since deploying its IP network, DR has doubled the numbers of hours of programming that it produces without increasing the budget, an accomplishment that Harrit attributes partly to technology. “A Gallup survey shows that DR is the preferred radio station in the country,” he says. “Technology is definitely an important element of our success.” In fact, DR remained the most popular radio station in the country even after reducing its workforce by 14 percent.

Another factor helping DR do more with less is a server-based workflow, which is also enabled by the Cisco network. Multiple people can work on the same file simultaneously.

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Next Steps

DR is considering the following new projects to increase its efficiency and competitiveness:

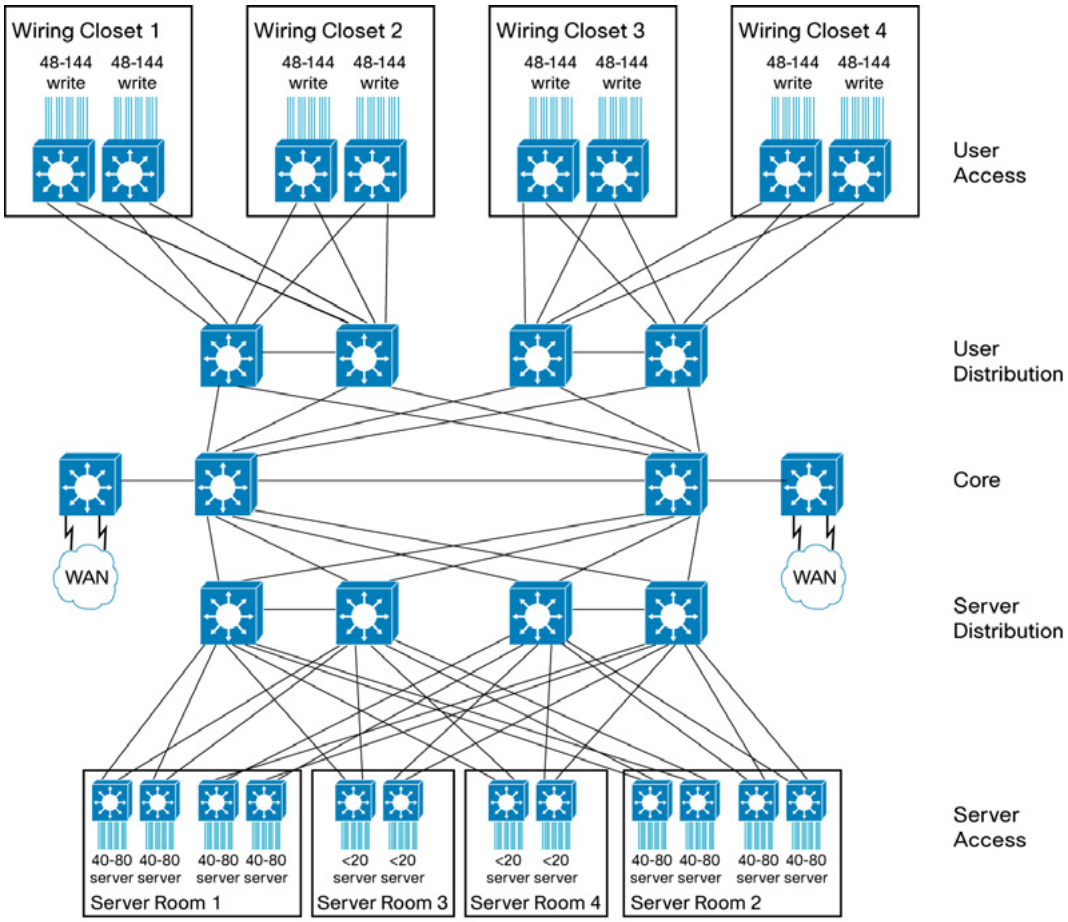
- Moving to high-definition (HD) video, which doubles or quadruples file sizes. The media house, cameras, and AV infrastructure are ready for HD. The challenge will be developing a switching topology that is accurate to the frame level. “The AV cannot be out of synch by even one or two frames, because this is visible to viewers,” Harrit says.
- Using the Cisco Nexus 5000 switch in its data center to support HD video.
- Using the Cisco Content Delivery platform for streaming.

Technical Implementation

DR’s three-tiered architecture comprises the following layers (Figure 1):

- **Access:** Traffic to and from all clients on the same floor is aggregated into one of two Cisco Catalyst® 6509 switches in a wiring closet. The building has 60 wiring closets in total. Even if one switch on the floor becomes unavailable, employees can continue working from another desk on the same floor or use the Cisco wireless network. Employees can do any kind of work, including file access and editing DV50 video files, from any location in the building.
- **Distribution:** Traffic from the wiring closets on each floor is aggregated to two distribution switches.
- **Core:** Traffic from the distribution switches is aggregated to redundant core Cisco Catalyst 6500 Switches on a 10 Gbps backbone.

Figure 1. Network at DR Headquarters in Copenhagen, Denmark



To edit video, the activity requiring the most bandwidth, DR employees need 1 Gbps bandwidth. However, not every employee edits video, and those who do generally are not all working at the same time. Therefore, DR provisioned 10 Gbps for every 12 to 15 employees. At the distribution layer, DR provisioned approximately 75 percent of the maximum anticipated bandwidth.

PRODUCT LIST

Routing and Switching

- Cisco Catalyst 6509 Switches at the core, distribution, and access layers
- Cisco Catalyst 4948 Switches to connect the data center and video server
- Cisco 871 Routers for home access

Voice and Unified Communications

- Cisco Unified Communications Manager
- Cisco Unified IP Phone 7960G

Wireless

- Cisco Aironet Wireless Access Points 1131AG

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Printed in USA C36-496075-00 09/08