Cisco IT
Data Center and
Operations Control Center
Tour

Data Center

and

Operations Command Center

Background

1. BACKGROUND

Data Center and Operations Command Center Background

Figure 1. Dick and Ian at Entrance to the OCC and Data Center

Dick: "My name is Dick Corso. I'm the senior manager of the IT Data Center global operations group. My overall team is responsible for the health of Cisco data centers and server rooms, more than 40 in all, worldwide."

Ian: "My name is Ian Reddy. I manage global operations at Cisco. My teams are responsible for incident management, supporting-infrastructure problem management, and for managing the batch processing environment across the many production and engineering data centers worldwide."

Cisco Data Centers

Figure 2. Dick Corso in Operations Command Center (OCC)

Dick: "Today we're going to take a tour of the IT Operations Command Center and the San Jose, California, main production data center. This data center is one of five production data centers that Cisco maintains worldwide.

"This San Jose data center houses all the intranet systems, the enterprise resource planning (ERP) systems like financials, and all the other internal applications and databases that our employees use.

"In addition to this main data center, there is also a second production data center on the San Jose campus. This second production data center, about a mile and a half from the first, houses the Cisco Website, Cisco.com, which is everything that our customers see over the Internet. Those are our two primary business production data centers. In North Carolina there is a third data center that we use primarily for disaster recovery of these two data centers and also for application development, testing, and staging environments for the production applications back in San Jose.

"In Amsterdam there is a fourth production, or business, data center that houses systems and databases to support local needs, or houses data that must be hosted in the Europe,

Middle East, and Africa (EMEA) region for tax reasons or other financial reasons . In Sydney Australia there is a small but growing business data center for the same reasons, for Asia and the Pacific region (Asia-Pacific). So, those five data centers support the core business processes of Cisco Systems. This is where we do most of the corporate business processing.

"In addition, we support another 40 or so data centers or server rooms that are of varying sizes. Some could be up to 20 thousand feet or more of data center space, but most are smaller. These data centers are predominantly focused on the development environment—the business of engineering Cisco products, whether it be Cisco IOS Software or new releases of a product.

"These data centers are scattered through 11 countries and 10 time zones. Most of these engineering data centers come about because Cisco acquires a company for its engineering talent, and then maintains its data center. When the acquisition took place, we left those engineering data center sites where they were."

San Jose Operations Command Center

Figure 3. Ian in the OCC

Ian: "The key point is that all that management and administration for all those data center locations is done from this IT operations center. Whether it's development or

production or the business process environment, we have responsibility for all that as an IT organization. So, this operations command center is the heart of a global data center.

"We're mainly concerned with tracking and responding to high-priority issues: priority 1 (P1) and priority 2 (P2) systems in our 5 business data centers and 40+ engineering data centers. Yet despite these data centers being all over the globe, we are a single Global Operations team, in the sense that we have one set of processes, and one global set of teams that administers those processes for production operations and is responsible for monitoring and maintaining availability of these systems worldwide. The Global Operations teams all report to Dick Corso, who reports to Lance Perry, the vice president of infrastructure.

"The incident management team working here recovers any down or degraded systems or services worldwide, and was staffed out of here 24 hours a day, seven days a week, three people on a shift with 12-hour shifts, 6 a.m. to 6 p.m., and 6 p.m. to 6 a.m. Pacific Time. Until recently, this location was the only location for incident management for our global data center system. In early February, 2004, we took our night shift out of San Jose and relocated that job to a similar command center in Bangalore, India. Now, their day shift, which is our night shift, operates from India."

Figure 4. San Jose OCC

Bangalore OCC

Dick: "So now we have two command centers, one in San Jose and a second command center in Bangalore, India. We just completed the out-tasking to Bangalore. I call it out-tasking instead of outsourcing because I'm still responsible for it. We do a 12-hour shift here in San Jose, 6 a.m. to 6 p.m. Pacific Time. Then at 6 p.m., the operations center at the Bangalore site takes over immediately, because we've got the CallManager set up to switch over at that time.

"It's a very productive situation for us. In fact, if we were to come here three years ago and attempt to out-task our operations center, we probably wouldn't have been able to do it successfully. Today we are able to do it purely for two reasons. One is that the technology is in place; but more fundamentally it's because we manage the processes so consistently that people are able to rely upon what we do with a high degree of certainty."

***Q:** And that's transparent whether it is here or in Bangalore?*

Dick: "If you called the data center operations number you couldn't tell who is handling your call. We've got nine people stationed here in San Jose, and nine people stationed in Bangalore India, and it has been very successful so far, although it took a lot of work to get us there."

***Q:** What kind of issues did you have to deal with in opening a second OCC?*

Ian: "There were a few infrastructure issues that we worked through, like making sure there was redundancy available within the Bangalore LAN, even through to the desktop switch level. We had to make sure that we provided the same failover capabilities that we have here in San Jose.

"For instance, in this OCC, which is active 24 hours a day, we have a backup OCC in a nearby building, a second command center, which is not normally staffed. If there is a fire alarm in this building, our team can go to the other building and as quickly as we can drive there, we can resume operations. We didn't have that in Bangalore, so in the past four weeks we set up a second command center in India, a failover center, on the Bangalore campus."

Physical Environment of the OCC

Figure 5. The San Jose OCC from the Observation Deck

***Q:** A lot of people say this looks like the bridge of the "Starship Enterprise." I see four banks of six monitors - 24 in all, with four big monitors. There's also an unusual shiny stainless steel ceiling with a large number of different lights, and what looks like a movie theatre screen in the back. What's this all about?*

Ian: "Well, this is no accident, the command center is meant to look like the bridge of the Starship Enterprise. It is the core of operations for our team. If something important is affecting the business, we're going to know about it in here.

"Also, it is meant to be a pleasant facility for tour groups. We constructed the back balcony specifically for Executive Briefing Center (EBC) tours. But it's also designed to spark our visitors' imaginations, to get them to ask questions, to think about what's possible and not just what they do today, and get a dialog going. So our data center tour is intended to be something a little different."

Figure 6. Ceiling Lighting in the OCC

Ian: "Let me talk about the lighting first. I don't know if you've noticed but it's been constantly changing. There are a lot of fluorescent and incandescent lights—the halogen lights are different colors. These two sets of lights vary in their relative levels, and in the relative color, very slowly over time. This continual change helps keep people alert and awake without being obvious and distracting. When you're on shift at 3 o'clock in the morning, these subtle changes help keep you awake

"The monitor desks are meant to be comfortable and flexible. You can change the heights of the benches; they are adjustable to each person's height. The IP phones have helped because we can move them and plug them in anywhere there's a network connection. We have flexibility with the laptops, plenty of screens, and the whole environment is intended to help make the workspace both comfortable and productive for the command center team."

Figure 7. OCC Staff at Work

Q: *Why are there 24 monitors but only three people on staff right now?*

Ian: "The OCC was built for the worse-case scenario. The worse-case scenario would be a major infrastructure failure that would impact Cisco's business. In that case we would need more than three people."

Q: *Has a worse-case scenario ever happened?*

Ian: "It has happened, and unfortunately, I'm sure from time to time it will happen again. We've been surprised by things like nasty attacks from the Internet, and natural disasters that we can't really do much about but we can plan for. Part of our plan was to always have enough capacity in the OCC for all the extra people we might need, plus a few extra spaces for manager coordination that might be necessary. During major crises we would use two separate bridges—we would have a technical bridge and a management bridge.

"And if there were extended incidents that lasted beyond a single shift, we would start a rotation of leads to keep the incident response process going for as long as we needed. There have been a few times when we've ended up with six or eight people in this room, coordinating as many as 20 to 30 or more people on bridges: 15 to 20 engineers on the technical bridge with another 10 to 15 people on the management bridge. The OCC room is built for scalability."

End
Data Center and Operations Command Center Background

You can go back to the beginning of this tour, or move to the next section to learn about how Cisco uses technology in the data center to support telephony, to monitor more than 10,000 network resources, and to provide enough levels of backup to keep the data center running every minute of the year without fail. Or you can go to any other part of the tour.

We hope you have enjoyed this part of the Cisco IT Data Center tour. You can contact your Cisco sales person to arrange an Executive Briefing Center visit, and request a live tour of the Cisco main production data center and operations control center.

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Note:
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