



CiscoIT@Work Case Study: **Cisco Converges PSTN and VoIP Infrastructure in India for Increased Productivity and Lower Cost**

Cisco Information Technology

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Overview

- **Challenge:**

Cisco India needed to build two separate VoIP networks, to deploy IP Telephony for all calls while conforming to India government regulations requiring PSTN and data network separation

- **Solution:**

Combine PSTN and VoIP on a single CallManager cluster using Call Partitions and Calling Search Spaces to maintain a virtual partition between PSTN and VoIP calls via the dial plan; gain regulatory approval (2005)

- **Results**

Employees at Divyshree Chambers and Waterford sites now use just one phone and one voice mailbox for both PSTN and VoIP connectivity

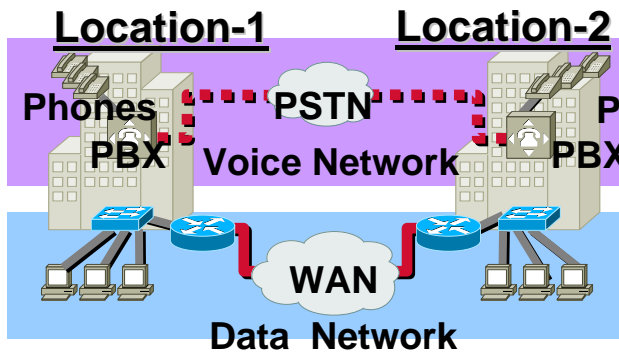
- **Next Steps**

Remaining PSTN CallManager clusters throughout Cisco India will be collapsed into a single cluster

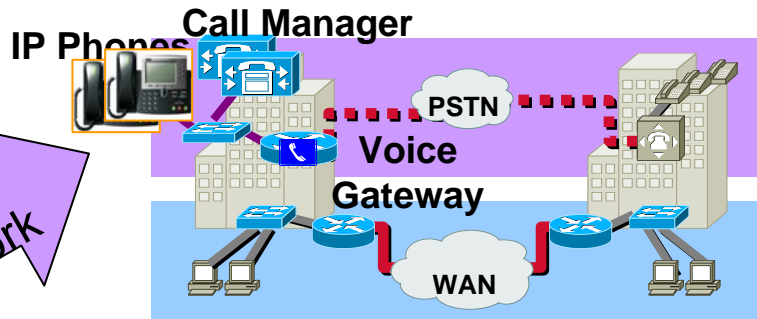
Challenge: India Government Requires Separation of PSTN and Data Networks

- There are still 3 ways to deploy IP Telephony: Over the PSTN, over the data network, or both – but maintaining separation of the two networks

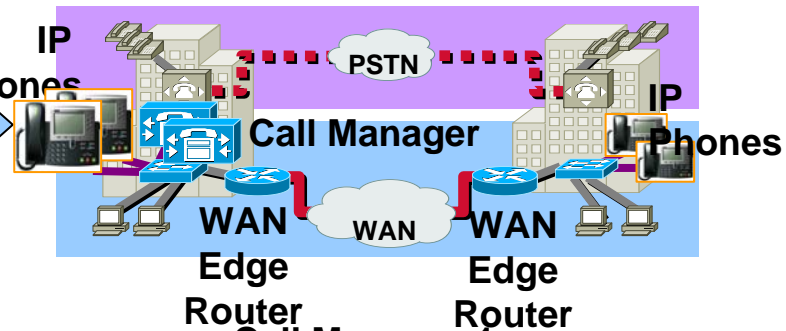
IP Phones can be added in Voice Network, Data Network, or Both



IP Phones on Voice Network



IP Phones on Data Network



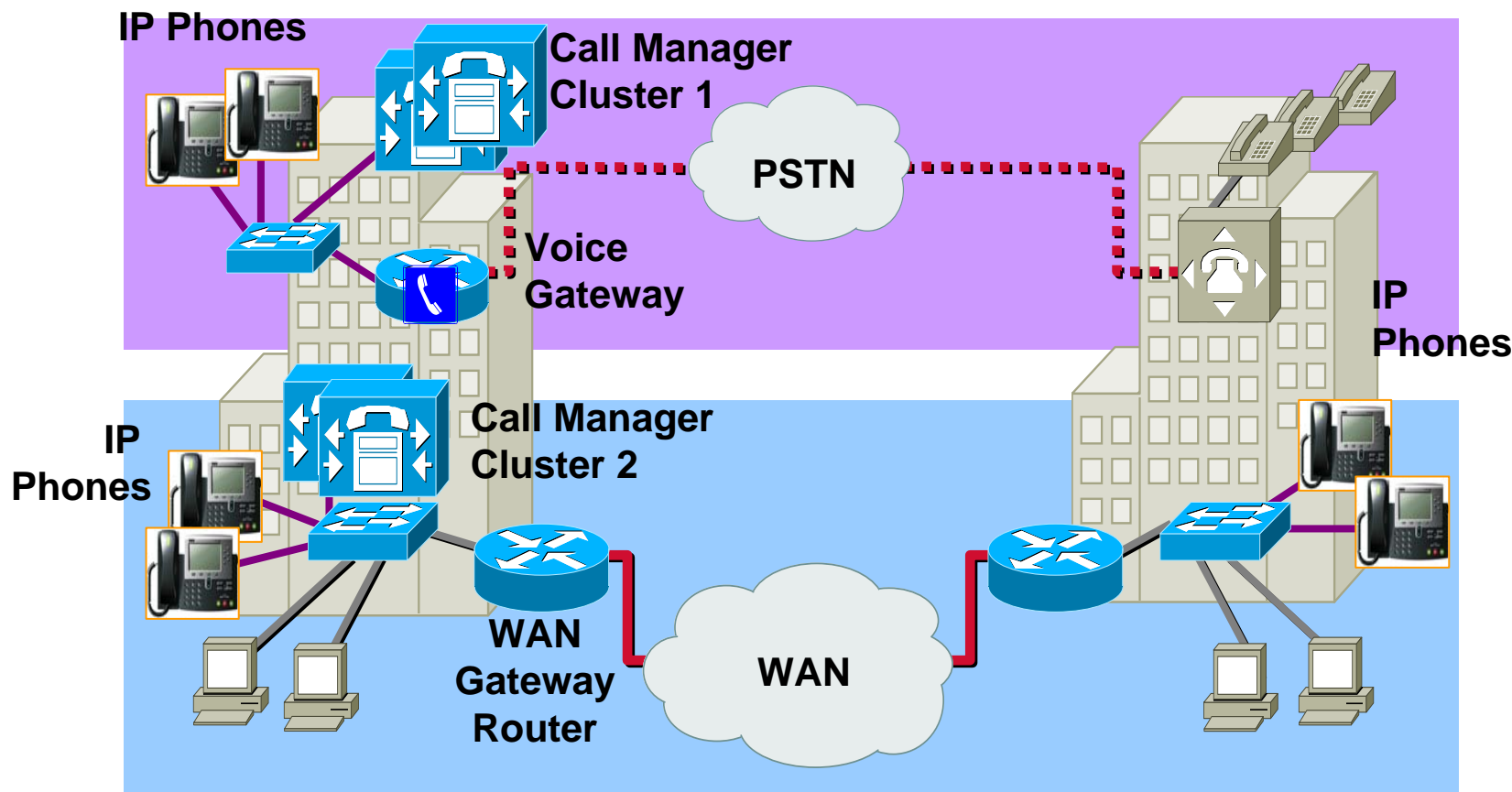
IP Phones on Each Network



Regulations require an air gap between voice and data network

Challenge: Cisco India Built IP Telephony Networks across PSTN and Data Network

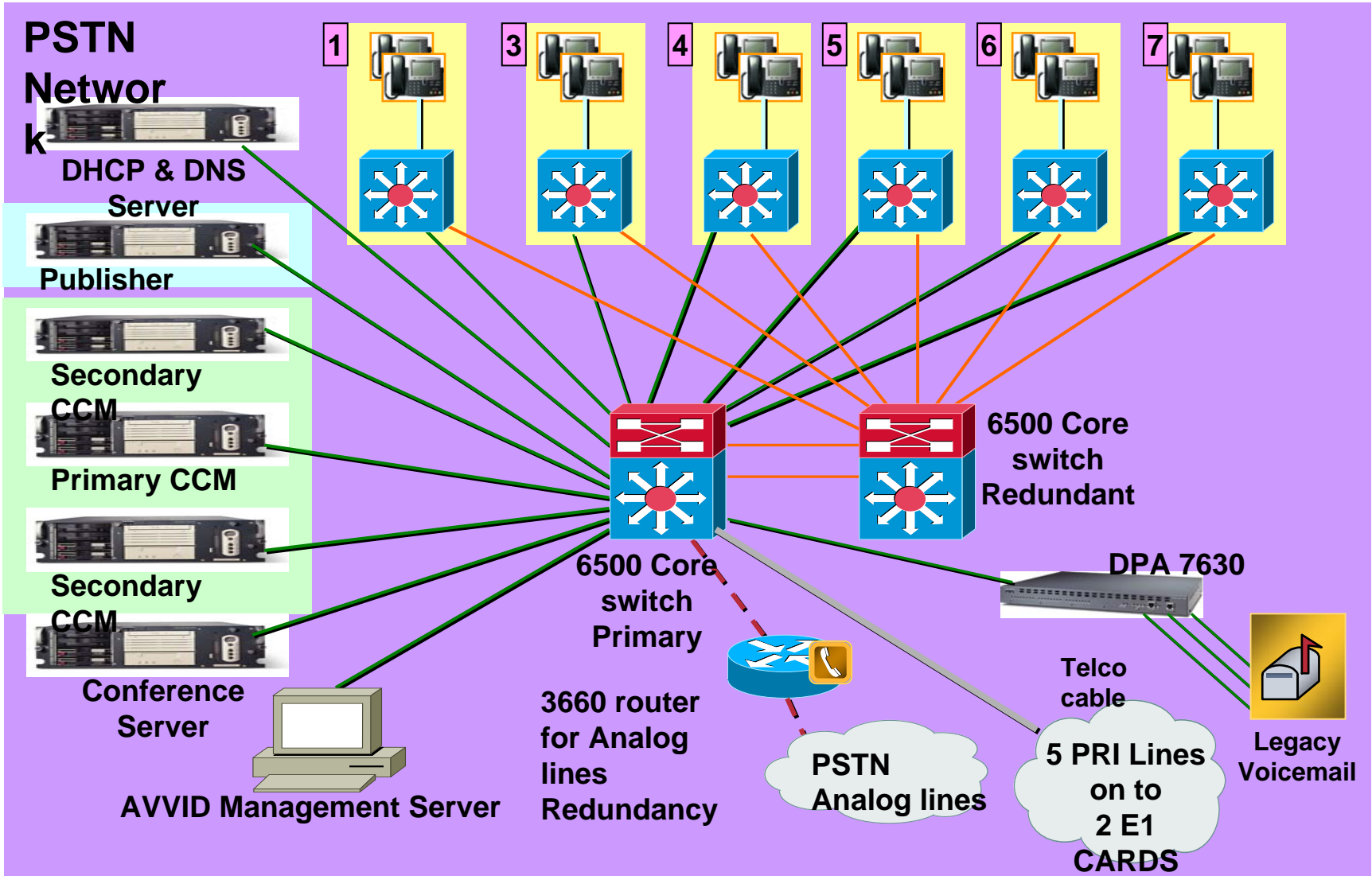
- Cisco India built two separate IP Telephony networks, across both the PSTN and the Data Networks; this required two separate CallManager clusters, voicemail systems, and IP Phones per desk



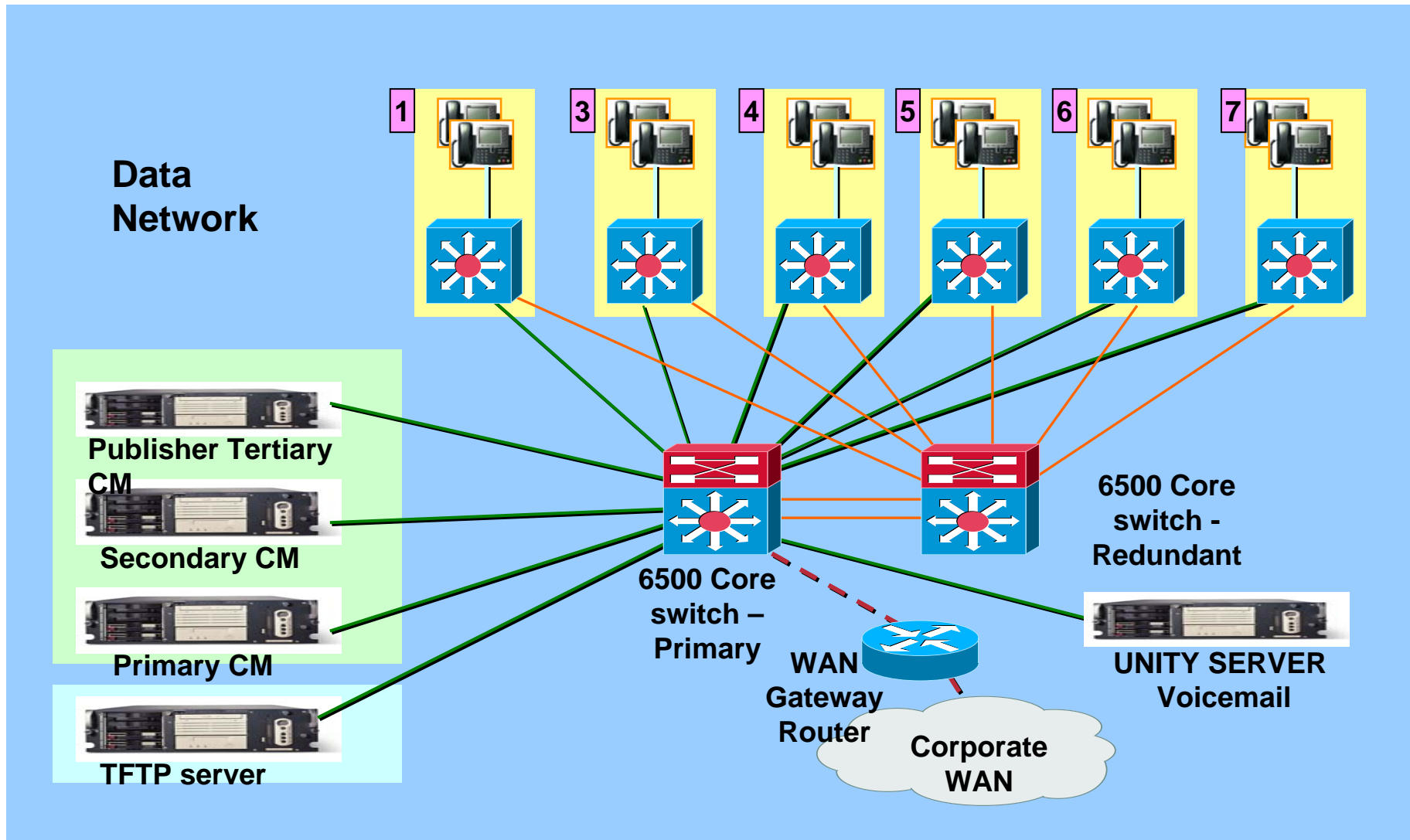
Challenge: Regulations require two networks

- **Cisco India needed to build two separate VoIP networks, to deploy IP Telephony for all calls while conforming to India government regulations requiring PSTN and data network separation**
- **Because PSTN and VoIP could not be interconnected, two network infrastructures were needed: two phones on every desk, two voice mailboxes for every employee, and two CallManager clusters**
- **This dual infrastructure was costly to deploy and costly to manage because it required twice the equipment and twice the effort to maintain**
- **Challenge was to find a way to merge physical aspects of the two infrastructures without merging the calls—and accomplish this in a manner acceptable to the local regulatory body**

Challenge: Cisco India VoIP PSTN Network 2004



Challenge: Cisco India VoIP Data Network 2004



Solution: Converging network requires regulatory approvals

- **Cisco IT Converged dual PSTN and VoIP infrastructures in a multi-step process:**

Gained regulatory approval to combine PSTN and VoIP voicemail systems

Provided virtual separation using Call Partition and Calling Search Spaces

Gained regulatory approval to combine separate PSTN and VoIP CallManager clusters into single cluster

Implemented CallManager cluster convergence at Divishree Chambers campus

Implemented CallManager cluster convergence at Waterford (Bangalore) site

Solution: (1) Voicemail Convergence Approval

- **Petitioned regulatory body to permit convergence of PSTN and VoIP voicemail systems**
 - Argued that voicemail was a store-and-forward technology**
 - No real-time flow of communications between the PSTN and the VoIP networks**
- **Persuaded regulators to allow convergence of VoIP and PSTN voicemail infrastructures**
 - Received approval in November 2003**

Solution: (2) CallManager Convergence Approval

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- **With voicemail convergence approval in hand, petitioned regulators to permit convergence of PSTN and VoIP network infrastructure**
- **Proposed single CallManager cluster with virtual partition separating PSTN and VoIP calls**
 - Submitted detailed design document to regulators; explained how Partitioning and Calling Search Spaces maintained separate calling networks on single CallManager cluster
- **Persuaded regulators to allow convergence of VoIP and PSTN infrastructures**
 - Long-standing relationship and absence of violations key
 - Received approval in June 2004

Solution: CallManager Convergence

- **Implementation of converged PSTN/VoIP CallManager infrastructure phased in**
- **Phase One converged CallManager clusters in Divishree Chambers**

PSTN CallManager cluster removed

PSTN infrastructure collapsed into remaining VoIP CallManager

Surviving CallManagers configured with virtual partitions to maintain separation between PSTN and VoIP calls

Two voicemail systems combined

PSTN phones removed and PSTN line added to VoIP phones

Phase One completed in October 2004

Solution: Convergence (Continued)

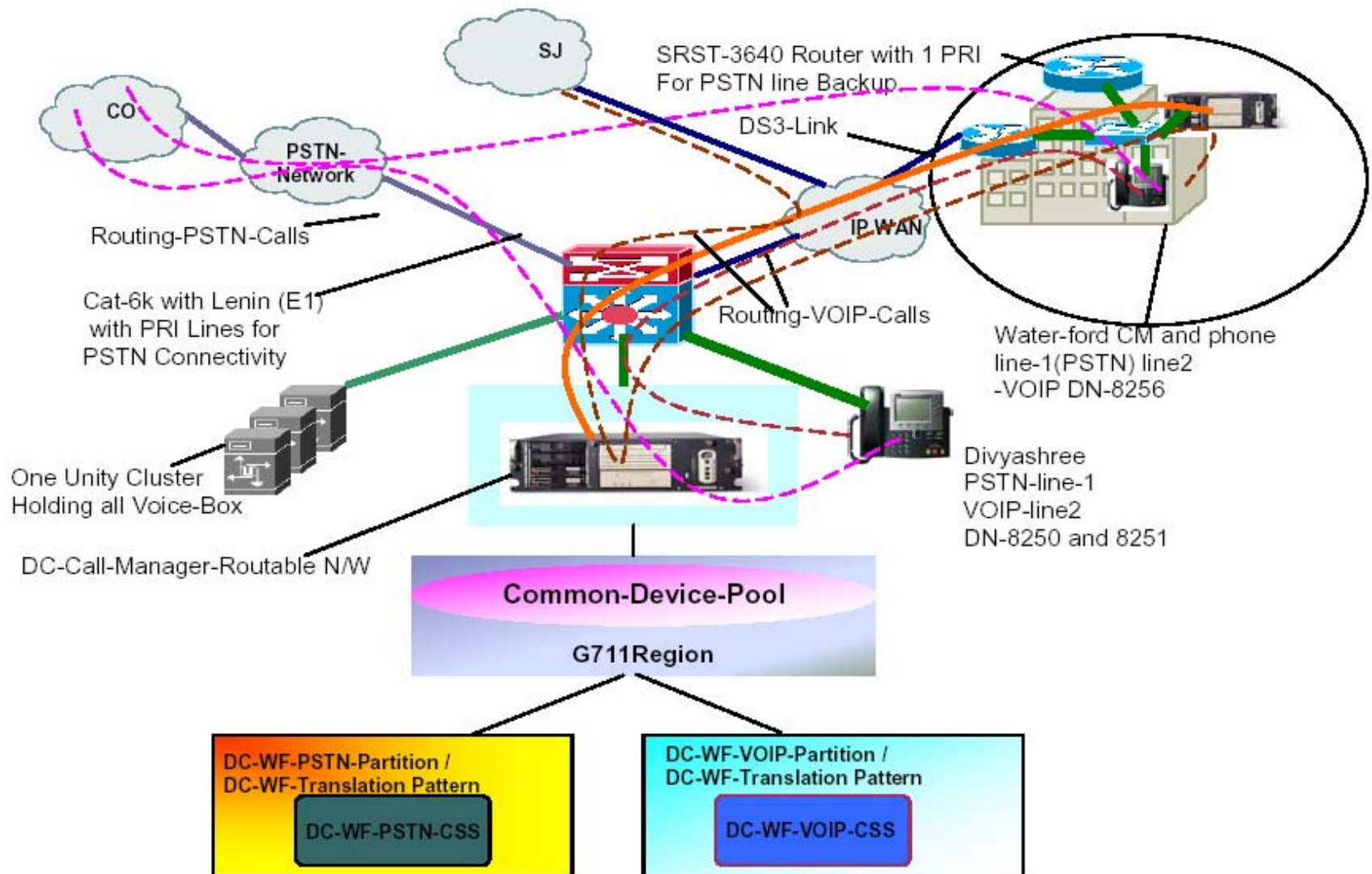
- **Phase Two Converged CallManager clusters at Waterford (Bangalore) site**

Waterford PSTN CallManager cluster removed and collapsed into VoIP cluster in Divishree Chambers

PSTN phones removed and PSTN line added to VoIP phones

Phase Two completed in March 2005

Solution: Cisco India – Converged VoIP Network



Results: Convergence is successful

- **Cisco employees on the Divyashree Chambers campus now use just one phone for both PSTN and VoIP connectivity**
- **Approximately US\$1 million of equipment has been reclaimed for local expansion**
- **Productivity has increased**
- **Operational costs have declined**
- **The converged environment provides a showcase that Cisco India sales people can demonstrate to customers**

Next Steps: Other Cisco India Locations Included in Converged CallManager Cluster

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- **The remaining PSTN CallManager clusters throughout Cisco India will be collapsed into a single cluster at Divishree Chambers supporting PSTN and VoIP for all Cisco India locations as time and budget allow**

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