Cisco **Survivable Remote Site Telephony**

Introduction

As enterprises extend their IP telephony and high-value application deployments from central sites out to remote offices, one of the factors considered vital in deployment is the ability to cost-effectively provide backup redundancy functions at the remote branch office. However, the size and number of these small-office sites precludes most enterprises from deploying dedicated call-processing servers, unified messaging servers, or multiple WAN links to each site to achieve the high availability required. The Cisco IP Communications Solution utilizes Cisco CallManager in combination with a feature called Survivable Remote Site Telephony (SRST) in Cisco IOS® software to enable companies to extend high-availability IP telephony to their small branch offices. The Cisco SRST solution provides a rich feature set in back-up mode and is a cost-effective solution that is extremely simple to deploy, administer, and maintain.

Key Features and Benefits

Cisco SRST is a critical component of a centralized call-processing architecture in which a Cisco CallManager cluster and application servers, located at a central site, provide telephony services for all sites of a corporation. With greater than tens of thousands of Cisco SRST sites deployed, this architecture now represents the majority of IP telephony deployments because of the many benefits it delivers.

| Centralized Call-processing Architecture enables:	Resulting in:
Delivery of rich feature set to remote branches—next-generation call centers, unified messaging services, embedded directory services, mobility, and soft phones during normal operations	Improved productivity
Centralized configuration and management	Reduced operations expense
Simplified management—Remote maintenance and troubleshooting	Reduced operations expense
Converged Voice and data network	Reduced operations expense
Reduced Install Cost (Shared CCM resource)	Reduced initial expense

When remotely placing IP phones from a Cisco CallManager cluster, call-processing redundancy must be provided in case there is a WAN failure. This is especially critical when emergency calls, for example 911 in the United States, need to be placed during a WAN outage.

How it Works

Cisco developed Cisco SRST technology for all Cisco IOS software platforms that support voice *(See Table 2 below for complete list)*. Cisco SRST comprises network intelligence integrated into Cisco IOS Software which acts as the call-processing engine for IP phones located in the branch office during a WAN outage (Figure 1).

Figure 1
Centralized Cisco Call Manager Deployment with WAN Failure the PSTN.
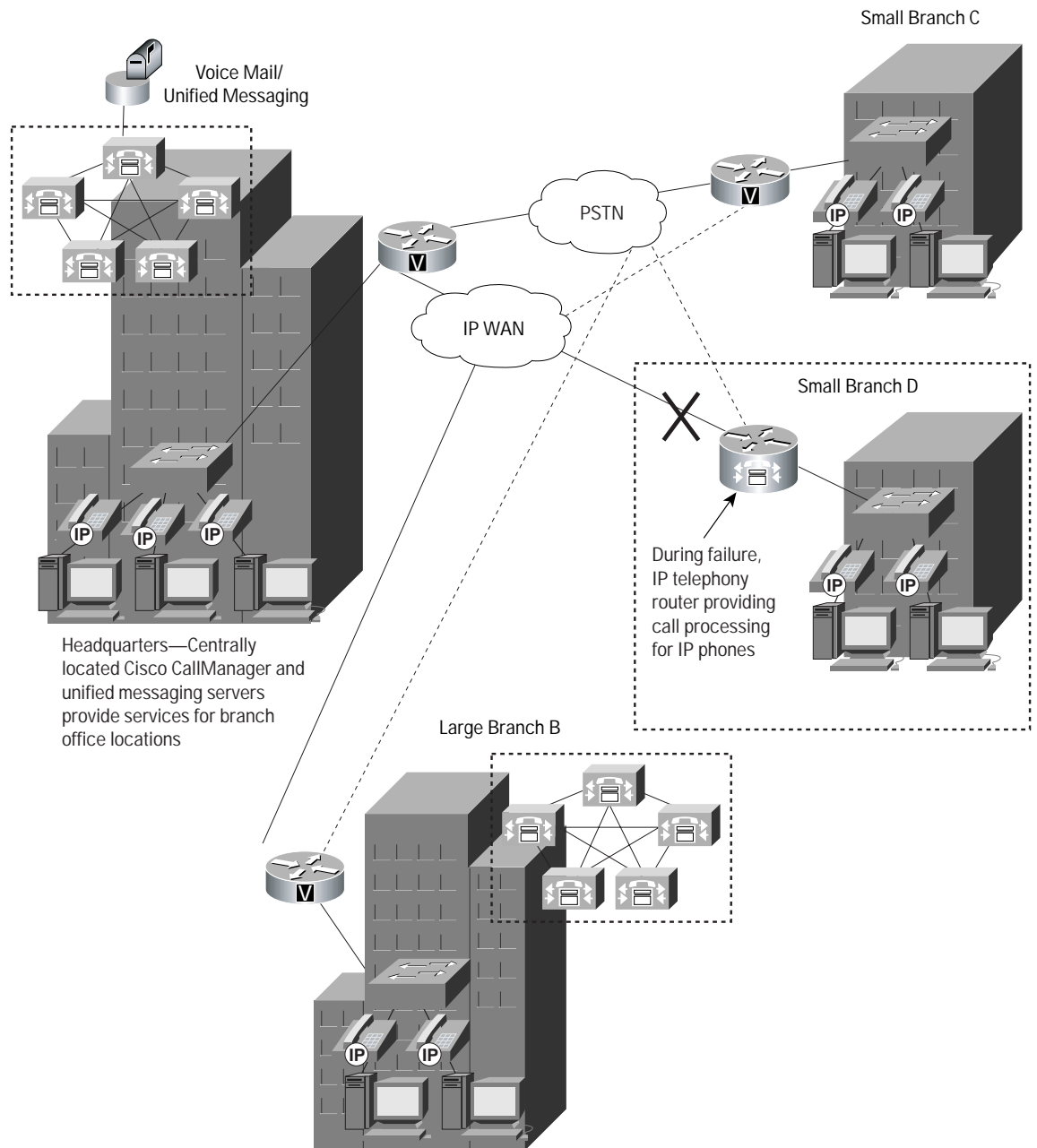
Cisco SRST functionality on the local branch office access router automatically detects a failure in the network and initiates a process to auto-configure the router to provide call-processing backup redundancy for the IP phones in that office. Once the router is configured, it provides call processing for the duration of the failure, ensuring that the phone capabilities stay operational. Upon restoration of WAN connectivity, the system automatically shifts call-processing functions to the primary Cisco CallManager cluster. Cisco SRST configuration only needs to be done once in the Cisco CallManager at the central site, simplifying deployment, administration, and maintenance. IT staff is not needed at the remote sites to manage the Cisco SRST feature.

Table 1 SRST Platform Density and Feature License Part Numbers

Platform	Number of Phones Supported	Part Number	Part Number (Spare)
Cisco IAD 2400, 1751, 1760, 26xx, 26xxXM, 3620, ICS 7750 MRP300 series cards (MRP300, MRP3-8FXOM1, MRP3-8FXS and MRP3-16FXS)	Up to 24 phones	FL-SRST-SMALL	FL-SRST-SMALL=
Cisco 265x, 265xXM routers	Up to 48 phones	FL-SRST-MEDIUM	FL-SRST-MEDIUM=
Cisco 3725 router	Up to 144 phones	FL-SRST-144	FL-SRST-144=
Catalyst 4000-AGM	Up to 192 phones	FL-SRST-144 FL-SRST MEUIUM	N/A
Cisco 3660, 3745, 7200 NPE—300/400	Up to 240 phones	FL-SRST-240	FL-SRST-240=
Cisco 7200—NPE400/G1	Up to 480 phones	FL-SRST-480	FL-SRST-480=

Cisco SRST Platform Information

The array of Cisco SRST-enabled platforms supports from 24 to 480 phones. Table 2 below illustrates platform density, and memory requirements for all Cisco SRST supported platforms. Cisco SRST bundles are also offered at a discount, when compared to purchasing bundle components separately. These bundles are listed in Table 3.

Table 2 Platform Details—IP Phone Density and System Requirements

	SRST 2.0	SRST 2.1	SRST 3.0	System Requirements	
Platform	Phones/Virtual Ports	Phones/Virtual Ports	Phones/Virtual Ports	Minimum Memory (Flash/DRAM)	Recommended Memory (Flash/DRAM)
IAD 2400	24/96	n/a	n/a	16/64	16/64
1751	24/96	24/120	na/	16/64	16/96
1751-V	24/96	24/120	24/120	16/64	32/96
1760	24/96	24/120	24/120	16/64	32/96

Table 2 Platform Details—IP Phone Density and System Requirements

	SRST 2.0	SRST 2.1	SRST 3.0	System Requirements	
ICS 7750 MRP300 series cards (MRP300, MRP3-8FXOM1, MRP3-8FXS and MRP3-16FXS)	24/120	24/120	n/a	16/64	16/96
3620	24/96	24/96	n/a	16/64	16/96
261x, 262x	24/96	n/a	n/a	16/64	16/64
265x	24/96	24/96	24/96	16/64	32/96
261xXM, 262xXM	24/96	24120	24/120	16/96	32/96
265xXM	48/192	48/192	48/192	16/96	32/96
2691	72/216	72/288	72/288	32/96	32/128
3640	72/216	72/288	72/288	16/96	32/96
3725	144/432	144/576	144/576	32/128	32/128
3745	240/720	240/960	240/960	32/128	32/128
3660	240/720	240/960	240/960	16/96	32/96
Catalyst 4500 AGM*	240/480	240/480	Future	32/128	36/128
7200 NPE 225*	200/800	200/800	Future	16/256	16/256
7200 NPE 300*	240/960	240/960	Future	16/256	16/256
7200 NPE 400*	480/960	480/960	Future	16/512	16/512
7200 NPE G1*	480/960	480/960	Future	64/512	64/512

* Cisco SRST 2.1.is supported in 15T. SRST - 3.0 will be supported in 12.3(2nd rel)T.
n/a—not a supported platform in this SRST release

Note: Memory recommendations are for Cisco SRST configurations only. Memory requirements vary by application—complex configurations with multiple features enabled will require more memory than simpler applications.

Table 3 Cisco SRST Bundles

Bundle Part Number	Includes
Cisco2651XM-V-SRST	FL-SRST-MEDIUM for 48 IP Phones, 1 AIM-VOICE-30, 32 MB Flash, 96 MB DRAM, Cisco IOS IP Plus for Voice gateway services and features
Cisco 1760-V-SRST	FL-SRST-SMALL for 24 IP Phones, 32 MB Flash, 64 MB DRAM, 1 DSP module (PVDM-256K-4), Cisco IOS IP/VOX Plus for Voice gateway services and features.

Cisco SRST Cisco IP Phone Support

Cisco SRST is supported on Cisco CallManager versions 3.01 or greater. The following table summarizes Cisco IP Phones supported by Cisco SRST

Table 4 IP Phone Support

Phone	SRST 2.0	SRST 2.1	SRST 3.0
Cisco 7960/7940	X	X	X
Cisco 7910	X	X	X
Cisco 7935	NA	X	X
Cisco 7914	NA	X	X
VG248		X	
Cisco ATA	NA	NA	X
Cisco 7905G	NA	NA	X
Cisco 7902G	NA	NA	X
Cisco 7912G	NA	NA	X
Cisco 7920G	NA	NA	X

Cisco IOS Software Image Support

The table below summarizes the correlation between platform, Cisco SRST version, and Cisco IOS software release.

Table 5 Cisco IOS Images

Platform	SRST Version *	IOS Image(s)
Cisco 1751	SRST 2.0	12.2(8)T, 12.2(11)T,12.2(13)T
	SRST 2.1	12.2(15)T
Cisco 1751-V	SRST 2.0	12.2(8)T, 12.2(11)T,12.2(13)T
	SRST 2.1	12.2(15)T
	SRST 3.0	**12.2(15)ZJ, June 2003**
Cisco 1760	SRST 2.0	12.2(11)T,12.2(13)T
	SRST 2.1	12.2(15)T
	SRST 3.0	**12.2(15)ZJ, June 2003**
Cisco ICS 7750 MRP300 series cards (MRP300, MRP3-8FXOM1, MRP3-8FXS and MRP3-16FXS)	SRST 2.0	**12.2(15)ZL, June 2003**
	SRST 2.1	**12.2(15)ZL, June 2003**
	SRST 3.0	**TBD**

Table 5 Cisco IOS Images

Platform	SRST Version *	IOS Image(s)
Cisco 2400, 2650, 2600XM series, 3640, 3660, 37xx	SRST 2.0	12.2(8)T5, 12.2(11)T,12.2(13)T
	SRST 2.1	12.2(15)T
	SRST 3.0	**12.2(15)ZJ, June 2003**
Cisco 362x, 261x, 262x	SRST 2.0	12.2(8)T5, 12.2(11)T,12.2(13)T
	SRST 2.1	12.2(15)T
	SRST 3.0	**n/a**
Cisco Catalyst 4500 w/ AGM	SRST 2.0	12.2(13)T
	SRST 2.1	12.2(15)T
	SRST 3.0	Future
Cisco 7200 NPE225/300/400/G1	SRST 2.0	12.2(8)T5, 12.2(11)T, 12.2(13)T
	SRST 2.1	12.2(15)T
	SRST 3.0	Future

Supported Features

Cisco SRST provides robust support for many IP phone features through the duration of the failure-functionality, which is not available from other traditional telephony solutions. Features supported during the failure are listed in Table 6.

Table 6 Cisco SRST Features

Cisco SRST 2.0
<table><tr><td>• Support for IP and POTS phones • Rehoming of IP phones upon failure to branch router for call processing • Maintain local extension to extension calls upon failure [1] • Maintain extension to PSTN calls upon failure • Up to 6 lines per phone • Call hold and pick up • Speed and last number redial • Up to 24 line appearances per system • Primary line support • Maintain existing calls upon recovery • Analog FXO/FXS • Calling party name • Caller ID and ANI support • WAN link support: FR, ATM, MLPP, Serial, AAL2, DSL</td><td>• Class of Restriction • Music and Tone on Hold, and on Transfer (MOH for endpoints PSTN only) • Distinctive ringing • DID and DOD calling • PSTN-T1 and E1 CAS trunks support • ISDN BR1 and PRI support • Call-detail recording and Radius server • Interworking with Cisco Gatekeeper • Transfer to voice-mail pilot number using PSTN • Alias lists for unregistered phones • Translation Rules support • TCL-based simple AA and IVR on local gateways • Transfer across H.323 network of Cisco endpoints</td></tr></table>

Table 6 Cisco SRST Features

Cisco SRST 2.1	•
• All 2.0 Features • CCM Phone Language Support • Global Call Forwarding enhancement	• In band DTMF Voicemail integration • Enhanced Dialplan-pattern
Cisco SRST 3.0	
• All 2.1 Features • E1 R2 support • Secondary Dial Tone • Dual Line Appearance per Button • 3-party G711 ad-hoc conferencing • Call Transfer with consult • Music-on-hold multicast • Cisco 7905 support • European Date Formats	• Enhanced dialplan-pattern Command • Increase in Directory Number Maximums • Additional Language Options for IP Phone • Configurable System Message • Improved debugs for phones • Symmetric SIP GW-to-GW DTMF relay • Ringing Timeout for Phones

1. Active calls to the PSTN from SRST IP phones will be maintained for the majority of calls and will be dropped after approximately 3 minutes. Active calls between users on the same LAN are not effected by WAN failure and will last for the duration of the call.

Summary

Cisco SRST, in combination with Cisco CallManager and AVVID architecture, provides enterprises a simple, cost effective solution for customers who want the benefits of a centralized call processing architecture.

For more information on Cisco IP Telephony Solutions and SRST, visit:

http://www.cisco.com/en/US/products/sw/voicesw/ps2169/prod_white_papers_list.html

http://www.cisco.com/en/US/products/sw/voicesw/ps2169/prod_technical_documentation.html

http://www.cisco.com/en/US/products/sw/voicesw/ps2169/prod_relevant_servs.html

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