SECURELOGIX®
CORPORATION

Deployment of Enterprise Telephony Firewall and Security System

Memorial Hermann Hospital Return on Investment Study
December 2000 through April 2001 - Interim Report

SecureLogix Corporation of San Antonio, Texas teamed with the Memorial Hermann Healthcare System of Houston, Texas ("MHHS"), to perform a study of the Return on Investment (ROI) from using our TeleWall® enterprise telephony firewall at MHHS, in addition to providing security benefits. The Memorial Hermann Healthcare System is the largest community-based, not-for-profit healthcare system in Texas consisting of 18 Hospitals and Specialty Facilities located throughout the Houston, metropolitan area.

Summary Results

The ROI study demonstrated that use of the TeleWall system produces a compelling annual internal rate of return for MHHS of 110%. The investment in the TeleWall system can be recovered, through cost savings, in approximately 11 months. Furthermore, use of the TeleWall enterprise telephony firewall allows MHHS to more aggressively manage telecommunications assets to protect the telecommunications and data infrastructure. Areas of cost savings include:

- Optimization of telephony service capacity.
- Reduction in full time equivalent (FTE) employee costs.
- Eliminating telephone use for unauthorized modem access to local Internet Service Providers (ISP).
- Replacement of expensive local access trunks with cost-effective tie trunks.
- Recovered capacity from reductions in inappropriate usage.
- Insurance premium reduction.

Environment:

Telephony services for the geographically dispersed member facilities are provided for and centrally managed by the MHHS Telecommunications Office located at Corporate Headquarters. The Director of Telecommunications, and his staff are responsible for the acquisition, management and operations of all telephony services for member facilities. Telephone services for member facilities are paid by Telecommunications Management and reimbursed by individual hospitals based on costs allocated by the Telco service provider The telephony infrastructure across the enterprise consists of stand-alone, multi-vendor and multi-generation equipment ranging from modern, large-scale Private Branch Exchanges (PBXs) to older, small-scale PBXs to simple key systems.

Project:

Memorial Hermann Hospital (the "Hospital") is a certified level-one trauma center, one of only two in the Greater Houston area, providing 24-hour emergency and trauma care

to more than 40,000 patients a year.   The Hospital has a Nortel PBX with 17 T-1 digital trunks and 40 analog copper lines. In December 2000, 17 TeleWall T-1 Appliances and four TeleWall Analog Appliances were installed to monitor activity on all of the Hospital's telephone lines. SecureLogix installed one TeleWall Management Server at the Hospital, two remote TeleWall Clients at Corporate Headquarters and one TeleWall Client at SecureLogix's office in San Antonio. TeleWall data has been collected since mid December.

Anticipated Benefits:

The TeleWall system was expected to provide the following benefits:
- Provide management the centralized visibility necessary to optimize telephony service, reduce costs and verify service provider performance against the service level agreements.
- Encourage a voluntary reduction of inappropriate calls and lower overall telephony costs, as users were made aware of the new telephone monitoring and control system.
- Enable departmental bill-back to recover costs from user organizations. Used as a management visibility tool, it is expected to help managers further reduce costs.
- Enable movement of telephony management functions from the PBXs to the distributed TeleWall system reducing operations, training and personnel costs.
- Enable increases in employee productivity and the ability to leverage employee expertise in the Telecommunications Management organization.
- Control access of authorized modems to a limited number of authorized users and prevent all other unauthorized access to the data network through modems.
- Prevent modem access to Internet Service Providers (ISPs) thereby eliminating sources of virus infection, preventing misuse of resources and recovering trunks for voice usage.

Realized Benefits of the TeleWall® System (to date)

Optimization of Telephony Service Capacity
According to the Director of Telecommunications, one of the primary benefits seen to date has been the quantitative data provided by the TeleWall system's management reports. The reports enable more timely and better-informed decisions regarding the quantity and provisioning of telephony services. Analytical comparison of the Hospital's TeleWall reports to data available at other facilities noted that the TeleWall reports are available in real-time, contain better data, have more variety, are clearer and are infinitely customizable to provide both macro and micro visibility into usage of the telephone system. With this level of on-demand and ad hoc visibility, telecommunications managers can fine-tune the amount of telephone service to ensure that they are providing the optimal amount without paying for excessive and unnecessary capacity. TeleWall reports showed that peak utilization of telephony services as an aggregate, never rose above 80% and average utilization did not rise above 70%.

Result: The Hospital estimates that optimization of telephone service using TeleWall reports, will allow a reduction of capacity by approximately 10% without affecting the quality of service. Based on an average telephone bill for the Hospital of approximately $50,000 per month, savings from optimization should yield $5,000 per month or $60,000 per year.
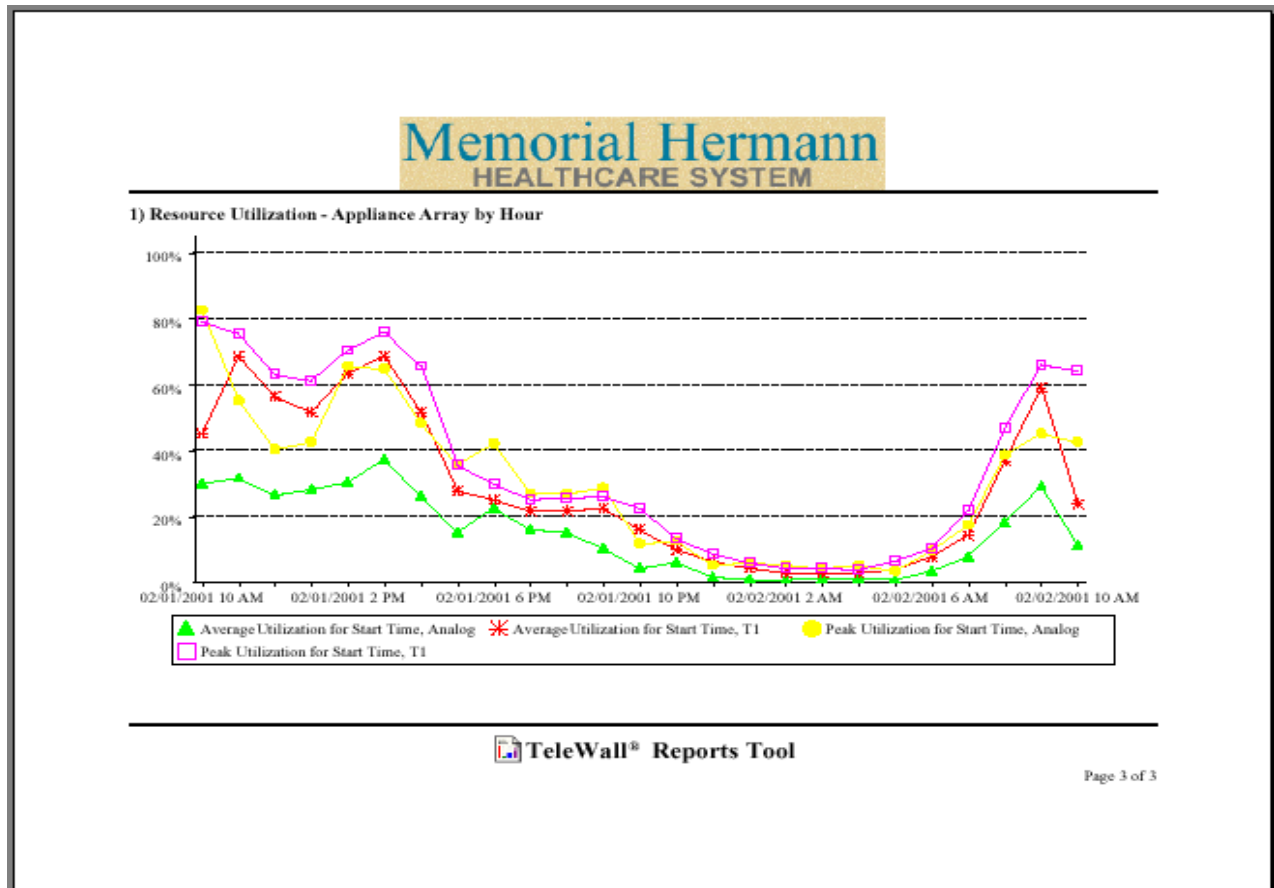
Figure 1 - Resource Utilization

Reduction in Full Time Equivalent (FTE) Employee Costs

Deployment of the TeleWall system enables the Director to improve manpower efficiency through remote visibility and management as well as consolidation of telephony control efforts. While there are no plans to reduce the number of FTEs in Telecommunications Management, he expects they will be able to handle more trouble tickets and an increase in the number of end-users served as the Hospital grows, without increasing the number of FTEs.

Result: The Director has estimated a savings at the Hospital of ¼ FTE valued at approximately $1,354 per month or $16,250 per year (loaded) as a result of deploying the TeleWall system.

Unauthorized Modem Access to local Internet Service Providers (ISPs)
The Director expected the TeleWall system would provide visibility into the various types of authorized modems within the hospital such as medical transcription, teleradiology, and modem calls to Medicare and Medicaid. The TeleWall system provided details of all modem calls into and out of the hospital. The most surprising result was that in addition to the expected modems, there were a number of users making modem calls on a regular basis that were traced directly to ISPs in the Houston area. The Hospital's Chief Information Officer stated that the Hospital has strict "no modem" and "acceptable-use" policies in place to specifically forbid using hospital computers and telephone lines for anything other than official hospital business. Modem connections to ISPs create vulnerabilities for unauthorized access to patient records, billing information and the Hospital's intellectual property (i.e. research, drug studies, etc.) and introduce unmonitored points of access to the network for infection and re-infection from computer viruses.

TeleWall® Firewall for Telephone Lines

1) HM Audit Detail - Top 10 ISP Callers

Source	Destination	Start Time	Duration
Unavailable	"EIC-3 ISP" [+1(713)767-1503]	02/19/01 14:54:27	0:43:07
	"NEXTNET-2" [+1(713)300-8820]	02/20/01 7:43:29	0:00:08
	"NEXTNET-2" [+1(713)300-8820]	02/20/01 7:43:57	0:40:38
	"NEXTNET-2" [+1(713)300-8820]	02/20/01 8:25:54	0:04:34
	"EIC-3 ISP" [+1(713)767-1503]	02/20/01 14:06:24	2:00:42
	"Earthlink-1" [+1(281)968-4492]	02/21/01 1:45:34	0:00:58
	"Earthlink-1" [+1(281)968-4492]	02/21/01 1:46:50	0:32:48
	"Earthlink-1" [+1(281)968-4492]	02/21/01 14:13:56	0:05:11
	"EIC-3 ISP" [+1(713)767-1503]	02/22/01 13:10:55	0:22:41
	"NEXTNET-2" [+1(713)300-8820]	02/23/01 8:08:59	0:00:10
	"AOL-12" [+1(713)300-0430]	02/23/01 17:00:28	0:08:35
Count			**11**
Sum of Duration			**4:39:32**
Average of Duration			**0:25:24**
"Hermann Hospital" [+1(713)704-]	"NEXTNET-1" [+1(713)300-0125]	02/21/01 11:00:17	0:01:16
	"NEXTNET-1" [+1(713)300-0125]	02/21/01 11:03:19	0:11:17
	"NEXTNET-2" [+1(713)300-8820]	02/23/01 8:09:23	0:00:10
	"NEXTNET-2" [+1(713)300-8820]	02/23/01 8:09:48	0:00:09
	"NEXTNET-2" [+1(713)300-8820]	02/23/01 8:11:40	0:08:35

TeleWall® Reports Tool
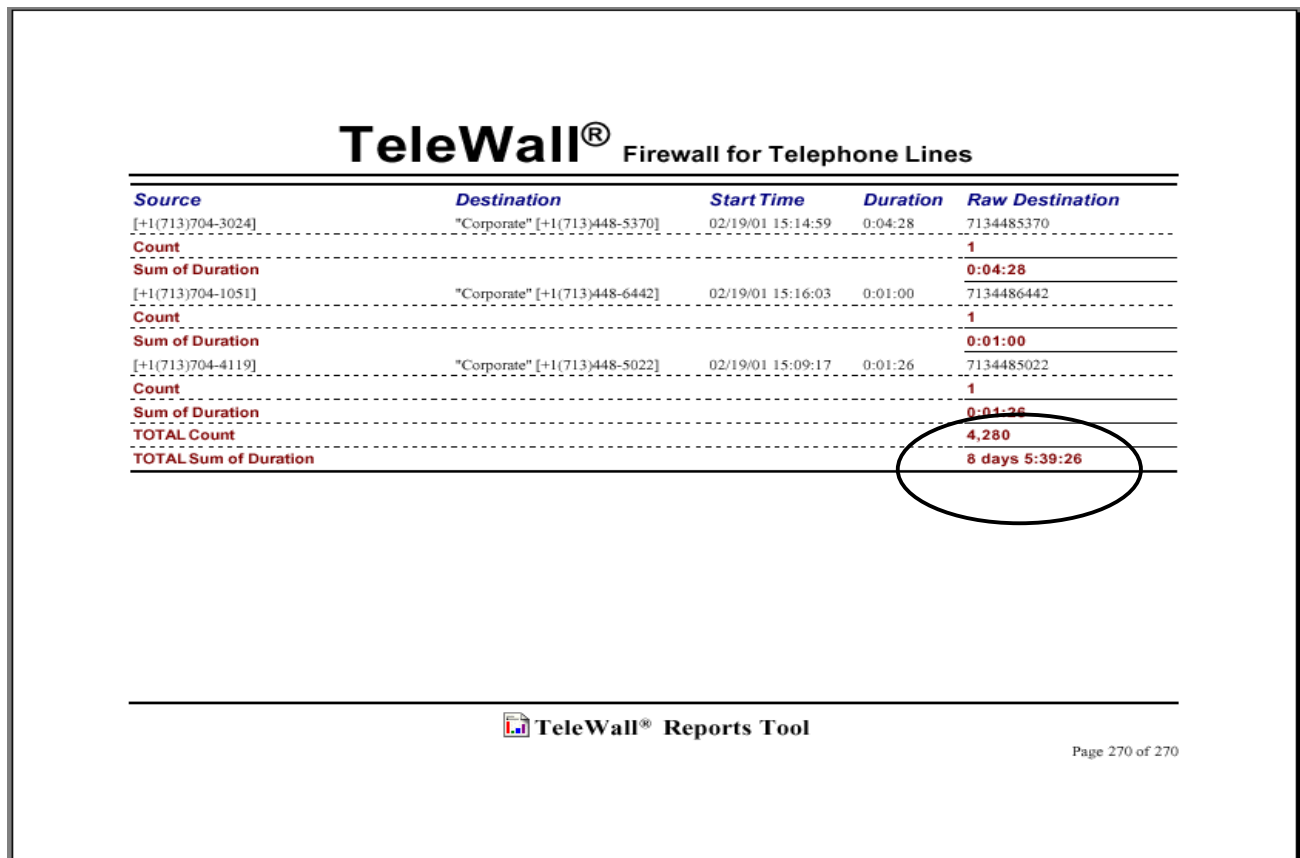
Page 3 of 5

Figure 2 - Modem Calls to ISPs

Result: The Director indicated that the Hospital would begin using the TeleWall system to enforce their existing acceptable-use policy and actively terminate modem calls to ISPs. He expects to recover voice trunks currently being consumed for modem calls to ISPs and release them for use as voice lines. Over

the course of the study, modem call durations ranged from 20 seconds to 17 hours with the average duration being 9 minutes and 57 seconds. He estimates that during the average modem call, that same line could have been used for up to four voice calls. By terminating these modem calls, he estimates they will be able to serve more voice users without adding additional trunks.

Replacement of Expensive Local Access Trunks With Cost-Effective Tie Trunks
Although the 18 facilities are independently connected to the Public Switched Telephone Network (PSTN), the TeleWall system provided detailed reports showing that a great deal of the total telephone traffic is between member hospitals. With the TeleWall system, they were able to quickly confirm for example, that over a representative one-week period, there were a total of 4,280 calls from Memorial Hermann Hospital to the Corporate Offices totaling over eight days in total call duration.

> *Result: Based on the ability of the TeleWall system to quickly and easily provide this detailed traffic analysis, the Director is using this objective data to justify replacing expensive local access trunks with inter-hospital tie trunks. He intends to replace a total of three local access trunks costing a total of $4,500 per month, with three tie trunks costing a total of $1,050 per month, for a total savings of $3,450 per month or $41,400 per year.*

TeleWall® Firewall for Telephone Lines

Source	Destination	Start Time	Duration	Raw Destination
[+1(713)704-3024]	"Corporate" [+1(713)448-5370]	02/19/01 15:14:59	0:04:28	7134485370
Count				1
Sum of Duration				0:04:28
[+1(713)704-1051]	"Corporate" [+1(713)448-6442]	02/19/01 15:16:03	0:01:00	7134486442
Count				1
Sum of Duration				0:01:00
[+1(713)704-4119]	"Corporate" [+1(713)448-5022]	02/19/01 15:09:17	0:01:26	7134485022
Count				1
Sum of Duration				0:01:26
TOTAL Count				4,280
TOTAL Sum of Duration				8 days 5:39:26

TeleWall® Reports Tool

Page 270 of 270

Figure 3 - Inter-Hospital Call Traffic

Anticipated Benefits of the TeleWall® System (in future)

Recovered Capacity From Reductions in Inappropriate Usage

Although there are many benefits from implementing an enterprise telephony firewall system, an immediate impact on monthly expenditures is often realized when the employees are advised of the existence of a call accounting system that is used to identify and track inappropriate use of the telephone system. The Gartner Group[1] estimates that simply announcing the deployment of a call accounting system will save 10-20% off the average monthly bill. The Director has not yet announced the existence of the TeleWall system while he continues to collect baseline usage data.

> **Result:** *The Telecommunications Director will release a Hospital-wide memo to announce the deployment of a call accounting system. The results will be analyzed against the baseline data to determine whether the announcement deters enough inappropriate usage to result in a measurable decrease in the overall telecommunications bill. Conservatively estimating the reduction in questionable calls at 10% of the average monthly telephone bill for the Hospital of $50,000 yields a savings of $5,000 per month or $60,000 per year.*

Departmental Bill-Back

The Director pays all telephone costs for member hospitals and is then reimbursed by the individual hospitals. He has already taken every action possible at a corporate level to reduce telephone charges such as ensuring all lines are working and provisioned correctly, as well as having negotiated favorable rates for all of his hospitals with the service provider. Further reductions in usage are possible if individual departments can reduce their own contribution to the total bill for their hospital. The telecommunications management systems currently in place are extremely limited in their capabilities, and the level of usage detail necessary for departmental participation can only be provided with the TeleWall system.

> **Result:** *The Director will provide department-level usage reports to department managers and hospital senior management as a management and accounting tool to enable individual departments to reduce their usage. He expects the TeleWall system will allow this departmental bill-back capability to be implemented quite rapidly and have a "low cost to execute," while providing management with objective indications of the success of cost savings measures.*

Authorized Modem Access Control

The focus of this case study to date has been on analyzing the financial return on investment. The TeleWall system feature still to be demonstrated is its ability to selectively allow modem communications between specified locations. The Telecommunications and Data Network Directors are very aware of the need to allow modem communications with a verified business purpose while terminating all others. The TeleWall system allows them to differentiate between the two, and explicitly limit access only to authorized users. For example, the Directors intend to use the TeleWall system to limit modem calls from specified telephone numbers in Radiology to a list of

physician's home telephone numbers to support teleradiology, to limit modem calls between Medical Transcription and their transcribers telephone numbers and limit modem calls from Accounting to Medicaid and Medicare telephone numbers.

> *Result: Carefully controlling authorized modem access into and out of the hospital demonstrates due diligence, and is necessary to protect patient privacy, intellectual property and hospital financial data. The Directors believe the hospital would suffer a monetary loss if an unauthorized modem access incident occurred, and considers implementation of a TeleWall system to be a form of insurance against such losses. The Director estimated the value of insurance premium dollars saved is approximately $25,000 per annum. The Directors intend to use the TeleWall system to enforce their existing written security policies and terminate all modem calls that have not been identified as having a verified business purpose, thereby bridging policy with enforcement.*

Centrally managing call permissions with the TeleWall® system

Implementation of the TeleWall system is allowing Telecommunications Management personnel to do less programming at the PBX by transferring functions to the TeleWall system. The Director intends to incrementally move Telco management functions from the various PBXs to the TeleWall system. He will begin implementation with call permissions which will limit user access to specified telephone numbers and services such as 900 and 976 toll calls, as well as calls to specific exchanges, area codes and country codes.

> *Result: By moving the call permission function to the TeleWall system, Telecommunications Management can centrally manage call permissions with less manpower and synchronously adjust call permissions across the enterprise in real-time.*

Project Economics

Cost of deployed TeleWall System					$187,135
Includes: hardware, software, installation, training and maintenance					
			Total Costs		**$187,135**
Cost savings from deploying this TeleWall System					
	Pct	Base	Month	Year	
Optimization of Telco service	10.00%	$50,000	$5,000	$60,000	
Full time equivilent Telco technician (loaded)	25.00%	$65,000	$1,354	$16,250	
Replacing access trunks with tie trunks			$3,450	$41,400	
Number of access trunks	Cost/Mo	Ext/Mo			
3	$1,500	$4,500			
Number of tie trunks	Cost/Mo	Ext/Mo			
3	$350	$1,050			
	Difference	$3,450			
Reductions in questionable calls[1]		10.00%	$5,000	$60,000	
Insurance premium savings			$2,083	$25,000	
	Total Savings		**$16,888**	**$202,650**	

Figure 4 - Project Costs and Benefits

Memorial Hermann Hospital   05/16/2001

Cash Flows

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Investment						
Total Project Expenses:	$ (164,095)					
Support and Maintenance:	$ -	$ (23,040)	$ (23,040)	$ (23,040)	$ (23,040)	$ (23,040)
Salvage Value:						$ -
Investment Cash Flow:	$ (164,095)	$ (23,040)	$ (23,040)	$ (23,040)	$ (23,040)	$ (23,040)
Benefits						
Total Project Benefits:		$ 202,650	$ 208,730	$ 214,991	$ 221,441	$ 228,084
Depreciation		$ (32,819)	$ (52,510)	$ (31,506)	$ (18,904)	$ (18,904)
Pre-tax Income		$ 169,831	$ 156,219	$ 183,485	$ 202,537	$ 209,181
After-tax Income		$ 169,831	$ 156,219	$ 183,485	$ 202,537	$ 209,181
Depreciation		$ 32,819	$ 52,510	$ 31,506	$ 18,904	$ 18,904
Operating Cash Flow		$ 202,650	$ 208,730	$ 214,991	$ 221,441	$ 228,084
Net Cash Flow	$ (164,095)	$ 179,610	$ 185,690	$ 191,951	$ 198,401	$ 205,044
Cumulative Net Cash Flow	$ (164,095)	$ 15,515	$ 201,205	$ 393,156	$ 591,557	$ 796,601

Net present value at rate of capital of 12% $ 523,364
Discounted cash flow rate of return (IRR) =   110%
Payback year =   1
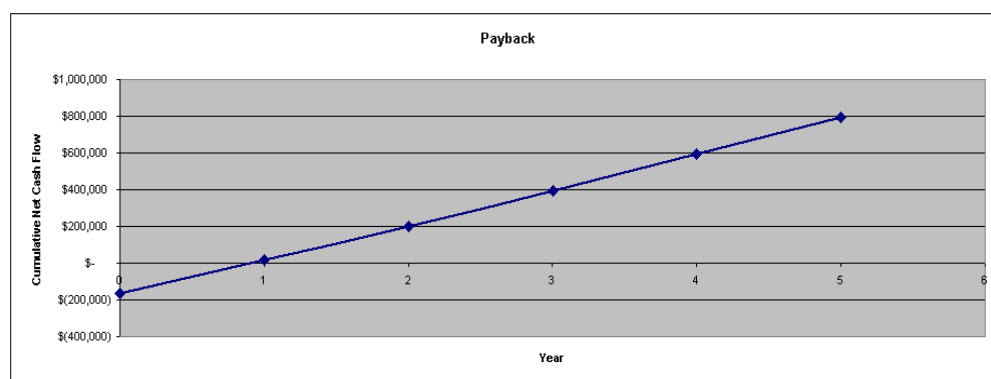
Figure 5 - Project Economics

[1] Cullen, A. Gartner Group, Management Update: Managing and Auditing Telecommunications Invoices, Feb 25, 2000