

# It's Not the Network! – Ways to Quickly Move the Problem Elsewhere

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CA Technologies

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Session Number (7614)



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# Abstract

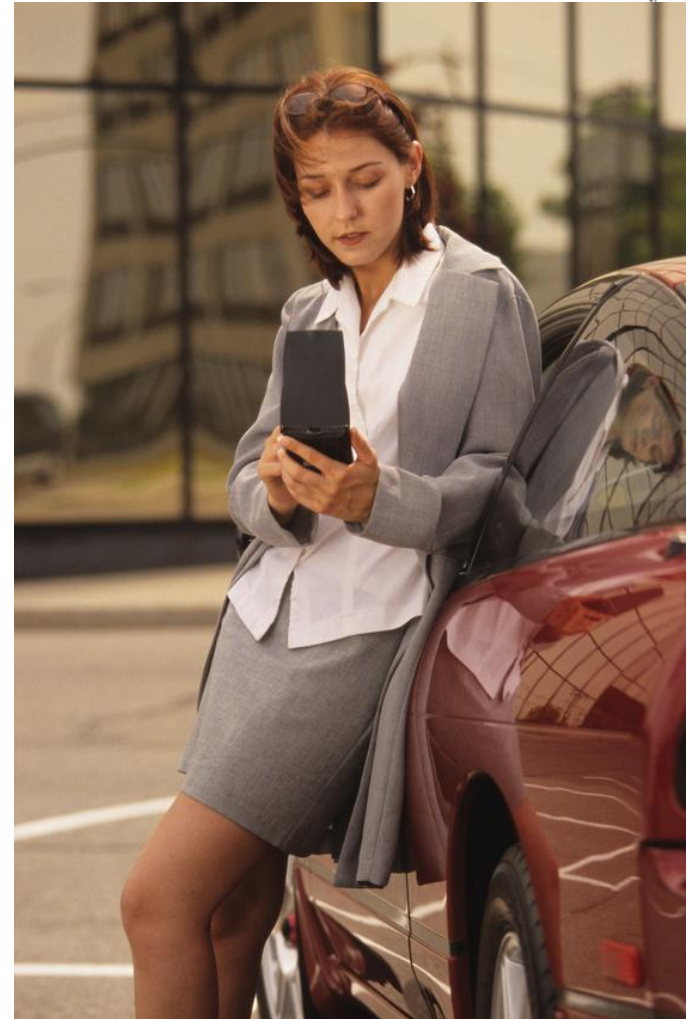


Why does everyone think it is the network, when there are so many other components that could cause performance headaches. Learn how to quickly triage your network (because we have everything consolidated) so that you can confidently tell them – it isn't my problem.



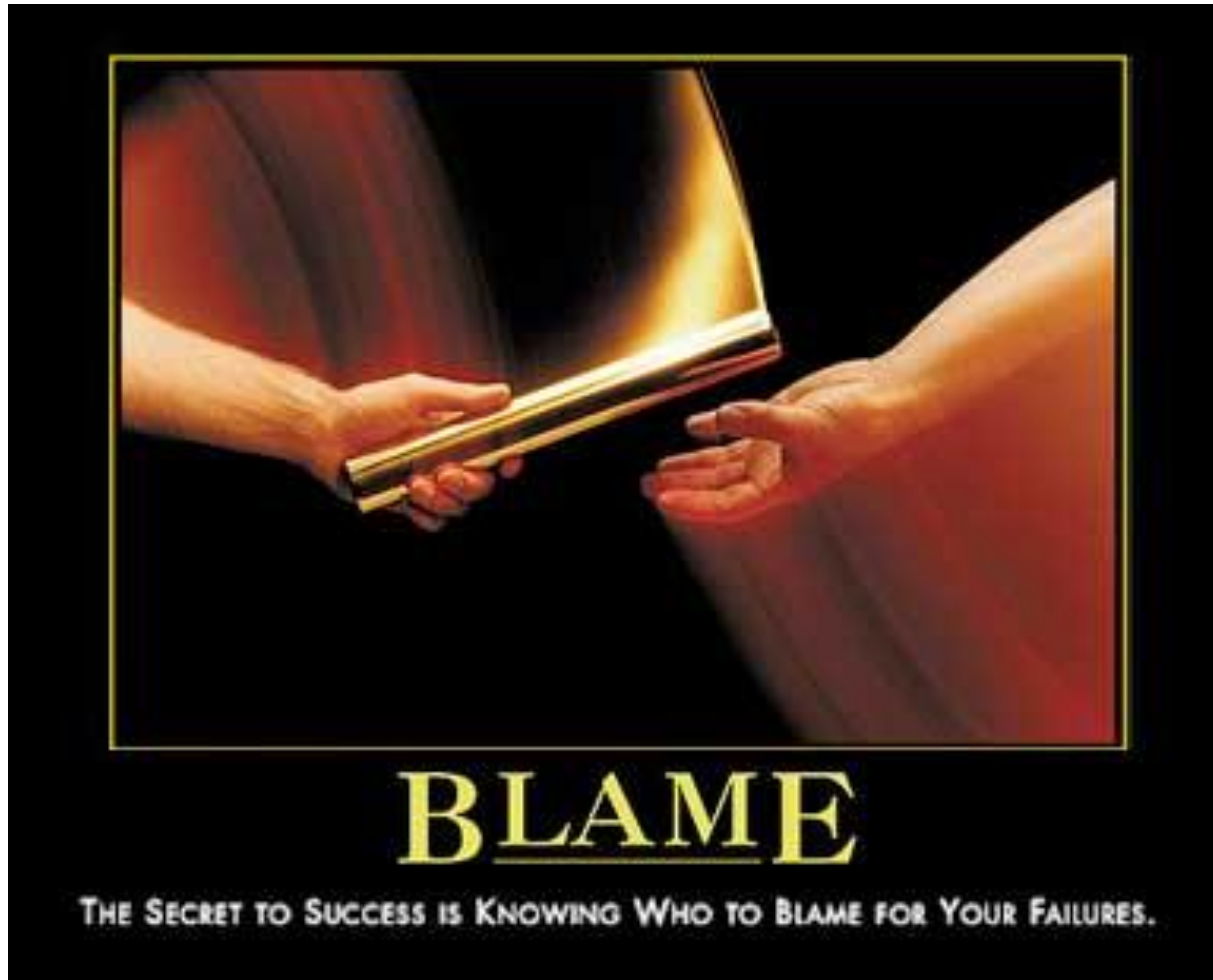
# Agenda

- Typical actions
- How important is the network
- Plan
- Tools & Actions
- Q&A



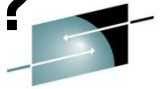


# Typical Actions





# Is this how you feel working on the network?



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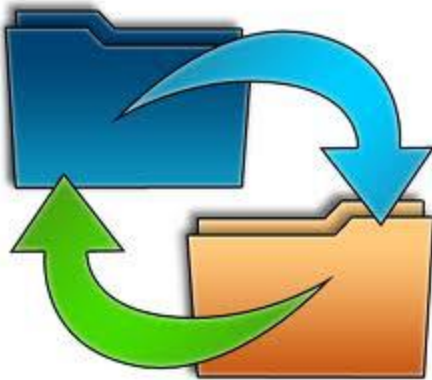
# Why Are Networks Important?



Customers



Suppliers



Data Transfers



Services



# What's Really Happening



**Mainframe  
sysprog**



**Network Admin**



**DBA**



**Applications  
pgmr**



**Windows SA**

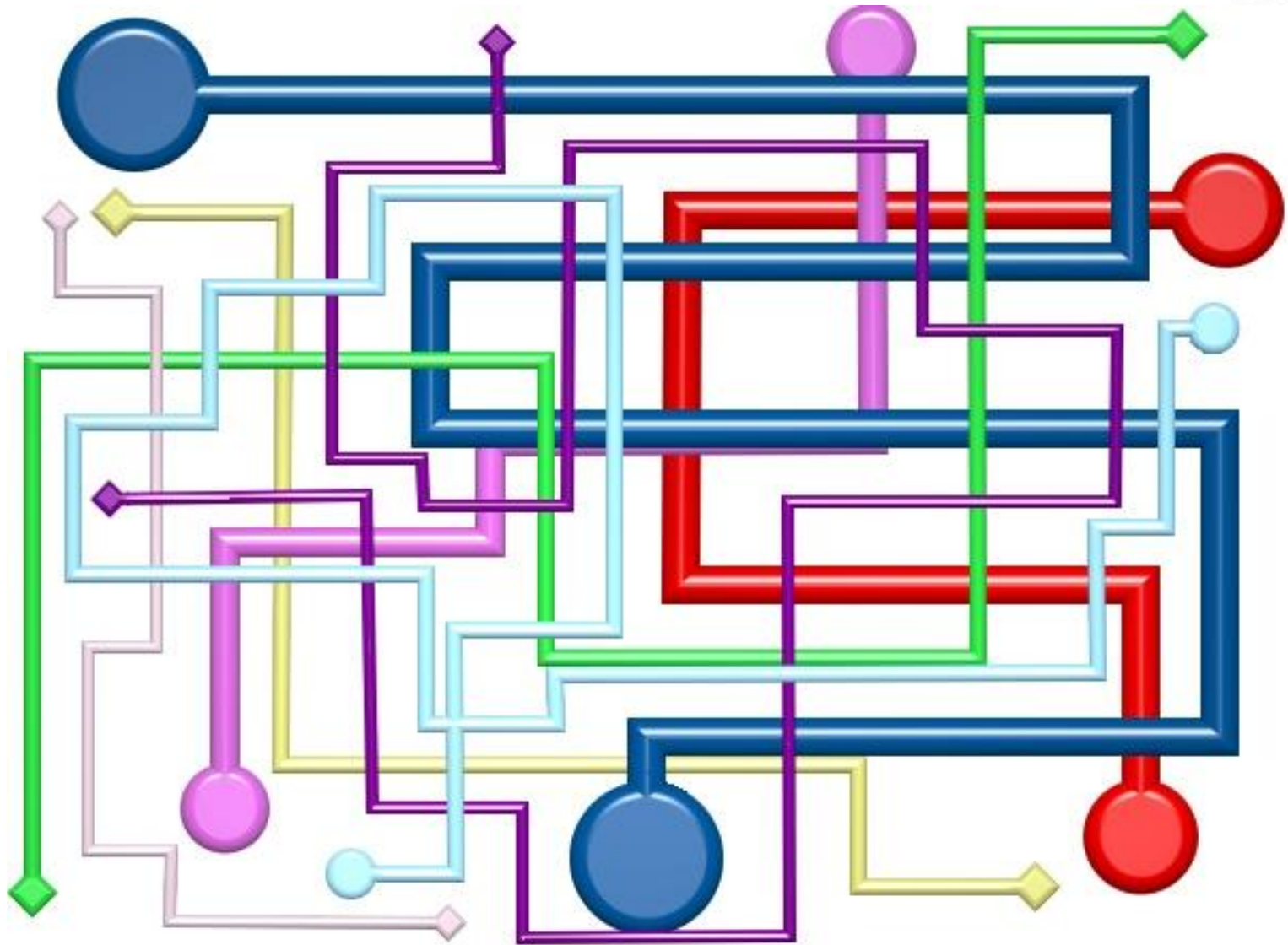


**UNIX SA**

## It's not my problem!

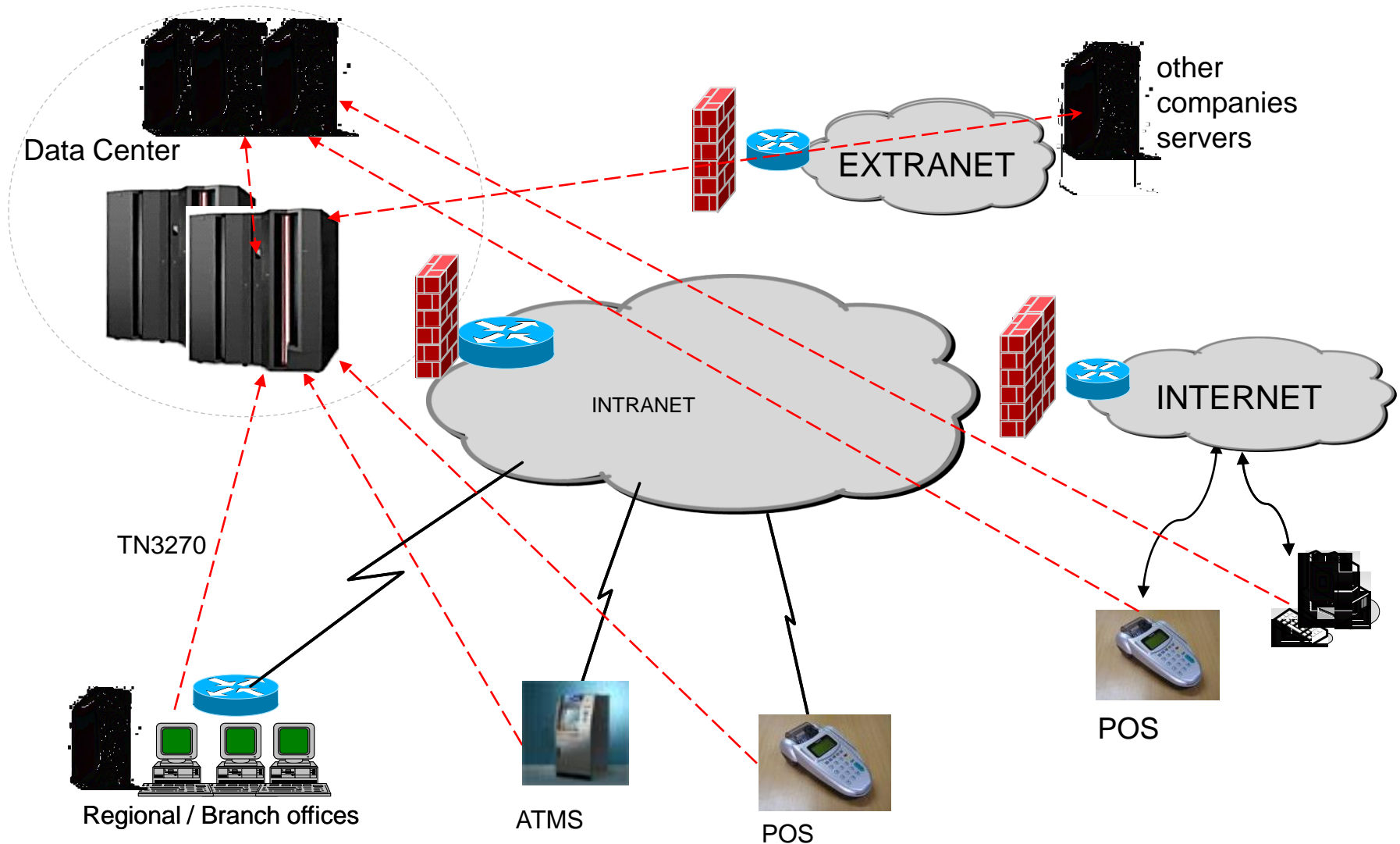


# No application is an island





# Mainframe IP network connections





# SLA errors



- Silo availability
  - .98 (mainframe) .75 (Unix) .70 (Windows)
- Response time (actual)
  - $.1 (S1) + .2 (S2) + .2 (DB) + .2 (\text{combined network}) + .2 (\text{firewall}) = .8 \text{ actual RT}$
  - If outside the business network, you don't have the internet hop times – that makes it worse



# Plan

- Know and Understand your “Customers”
- Understand SLAs
- Create a configuration diagram
  - Applications
  - Business Services
- Document network connections VTAM, EE, TCP/IP,...
- Understand Normal
- Proactive Management
- Automate



# Your Customers

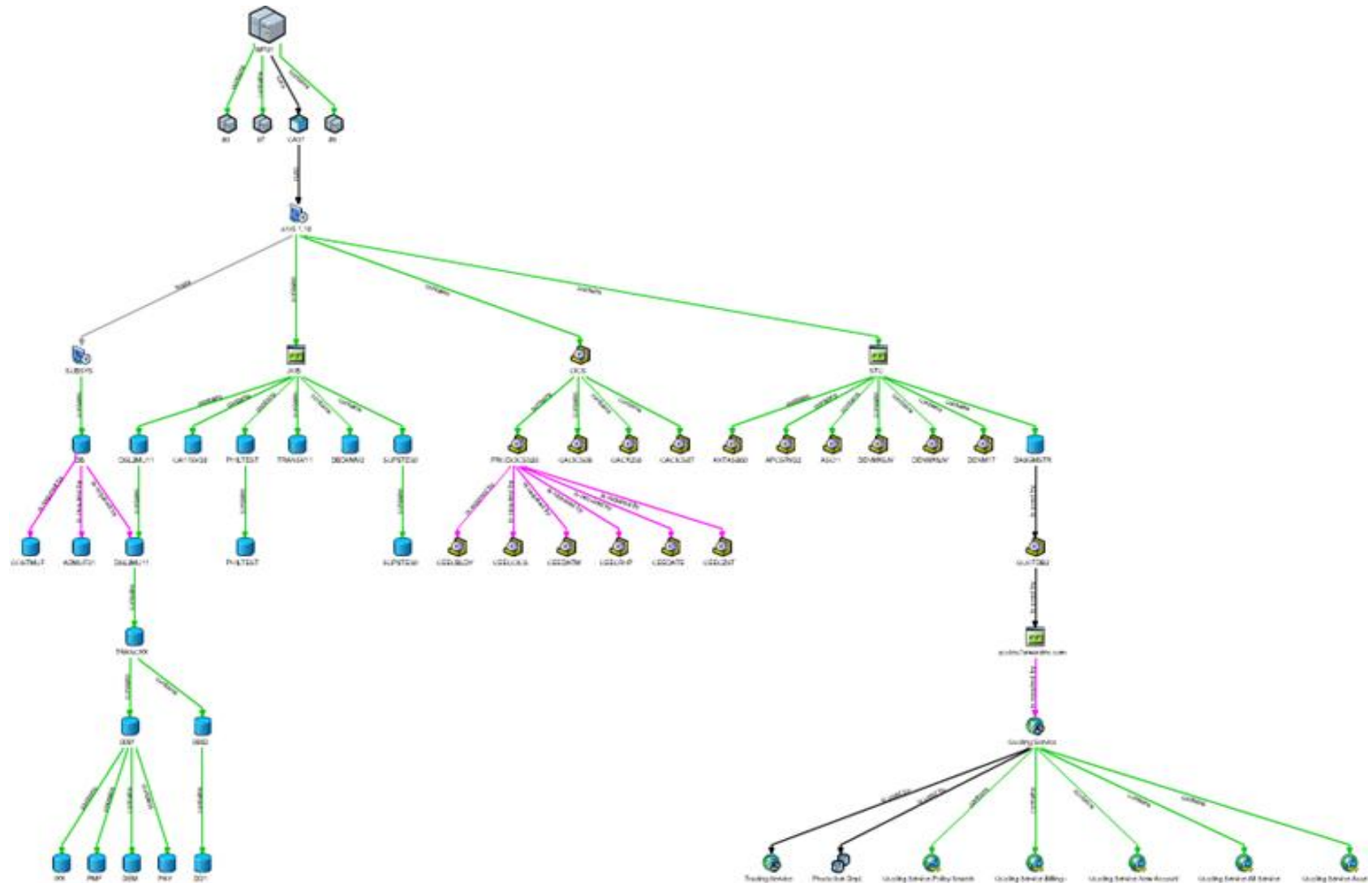
## Internal/External

- Who are your customers?
- Keep customers happy
- Build the business



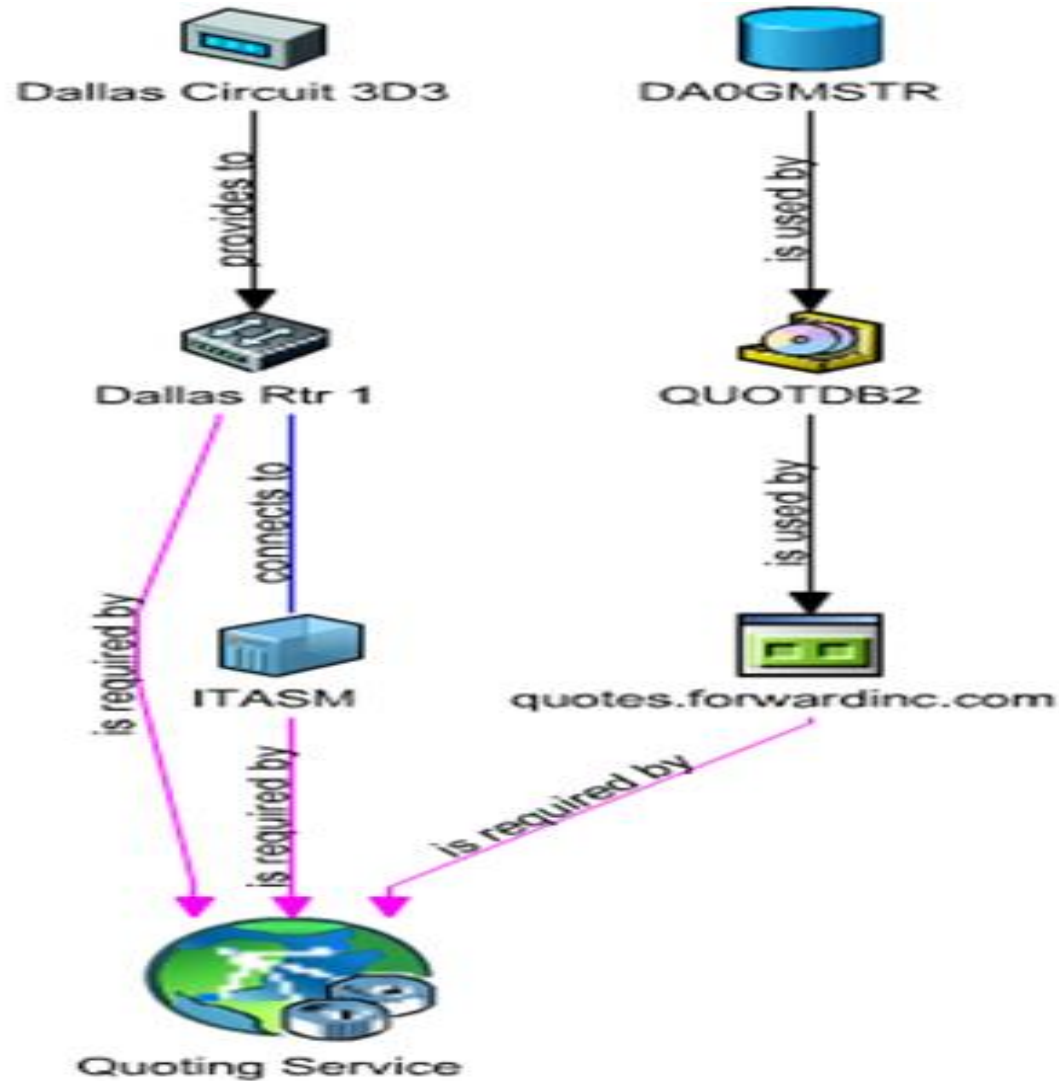


## Applications/Business Services





# Document Network Connections

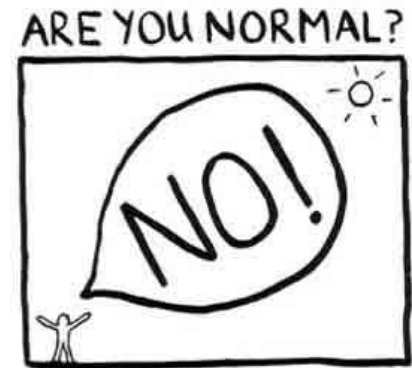




# Understand “Normal”

## Normal

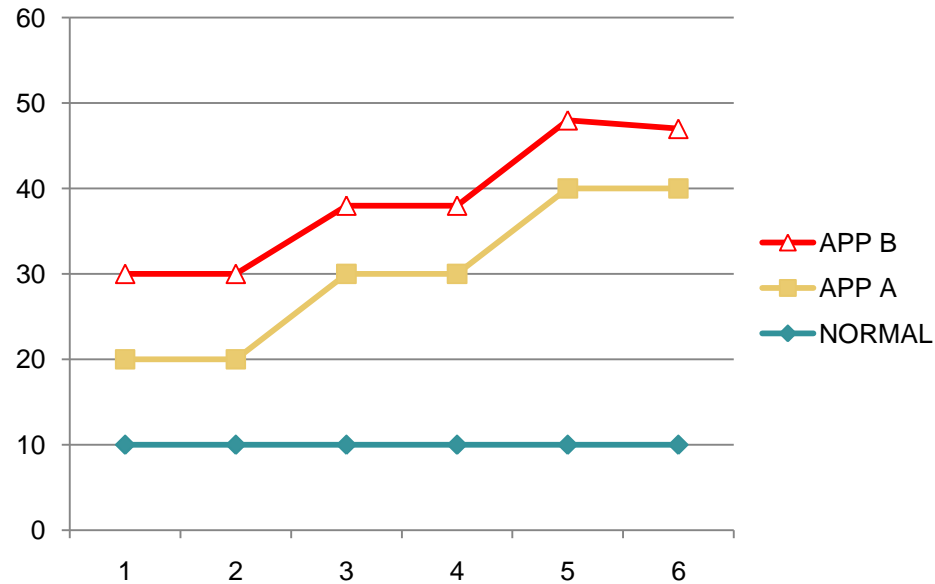
- Usual – conforming to the usual behavior
- Healthy – values are reasonable and expected
  - How long are connections usually up?
  - What is % busy normally?
  - What is the usual response time?
  - Which applications use which connections?





# Baselines

Compare “normal” (baselines) to current behavior.





# Understand “Normal”



CSNM30----- TCP/IP : TCP Application Activity List -----TCPIP3  
 Command ==> \_ Scroll ==> CSR

Address Space	S=Traffic Statistics						C=Connections		DT=Duration Times		
	0.01s	0.1s	0.5s	1s	10s	1m	10m	1h	10h	>10h	
AMY	0	0	0	0	8	2	1	2	3	0	
ANTYV01	0	0	1	2	2	0	0	0	0	0	
AUBT3SRV	0	0	0	0	1	6	563	11	0	0	
A540BASE	0	0	0	0	0	0	1	0	0	0	
A540HPHA	0	0	0	0	0	0	1	0	0	0	
A540HPO	0	0	0	0	0	0	2	0	0	0	
BAIMI02	0	1	2	1	0	0	0	0	0	0	
BAR\$100T	0	0	3	0	1	0	0	0	0	0	
BELDO05A	0	0	2	0	2	0	0	0	0	0	
BHASA133	0	0	0	0	1	1	0	2	0	0	
BHAUN01	0	1	1	0	0	0	0	0	0	0	
BRAMA15T	0	0	0	0	1	0	1	0	0	0	
B61AS31	0	0	2	8	3	16	11	0	0	0	
B61AS31S	0	0	0	0	1	0	0	0	0	0	
CA70NL74	0	0	2	2	2	0	3	0	0	0	
CA75CPM	0	0	1	1	0	5	3	2	0	0	
CA75JFM	0	0	2	0	0	5	3	2	0	0	
CA75N243	0	0	2	7	0	0	0	0	0	0	
CCISL	0	0	3	8	25	16	13	10	0	0	
CCISL GW	0	0	3	0	0	2	6	4	10	0	
CCITCP	0	0	68	23	13	8	11	4	7	0	
CCITCP GW	0	0	0	0	0	0	0	0	0	0	
CCITCP2	0	0	0	0	0	5	6	6	1	0	
CERRI01S	0	1	3	2	2	0	0	0	0	0	
CHUST02F	0	0	1	2	1	0	0	0	0	0	
CIZMI01	0	0	0	5	4	0	0	0	0	0	
CORMA21	0	3	34	11	2	0	0	0	0	0	
CSNM30	0	0	24	13	4	1	0	0	0	0	
CSQ2CHIN	0	0	0	0	2	0	0	0	2	0	
CTUFTP03	0	0	0	2	0	0	0	0	0	0	
CTUFTP04	0	0	1	1	2	0	0	0	0	0	
DB2FW	0	0	718	992	804	1	0	0	0	0	
DEKDO01	0	0	1	1	0	0	0	0	0	0	
DENMX6JV	0	0	0	0	38	0	0	0	0	0	
DENM17	0	0	0	0	0	0	0	0	0	0	



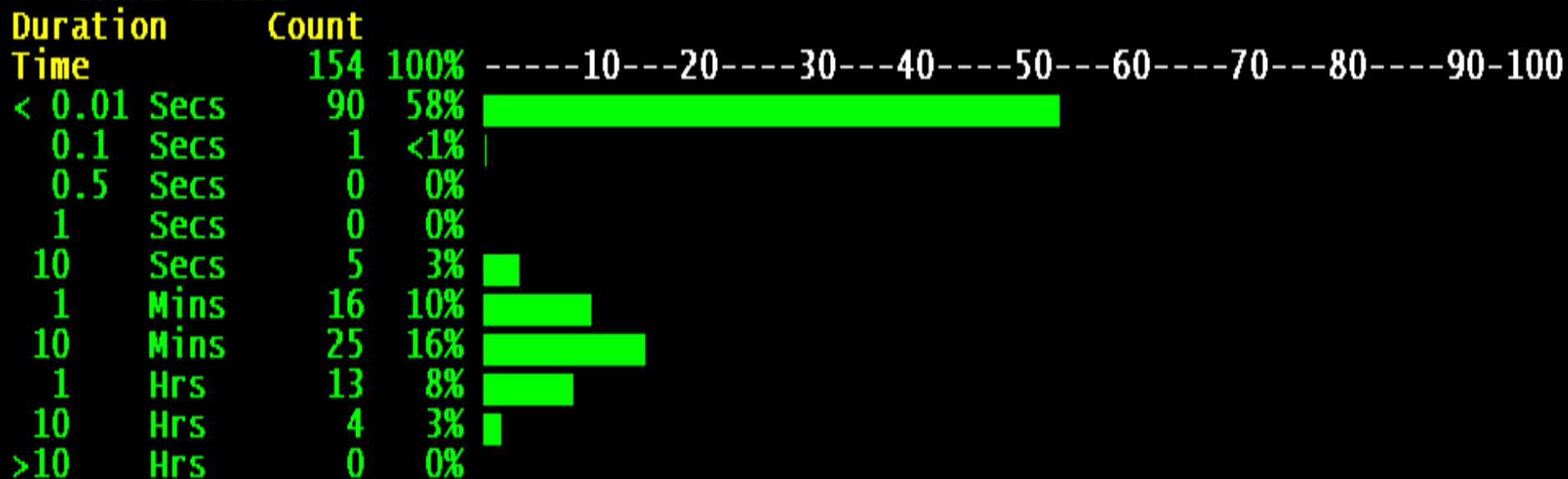
# Understand “Normal” - Connection Durations



```
CSNM30----- TCP/IP : TCP Connection Duration Times -----
Command ==> _ Scroll ==> CSR
```

```
Remote Address ..... 138.42.4.66
Stack ..... TCPIP31
TCP Connections Total ..... 158
TCP Connections Active .... 4
```

---Conns Ended---





# Application-to-Interface Correlation



```

DENM44----- TCP/IP : Application Traffic Statistics -----
Command ==> _ Scroll ==> CSR

Application Name ... TELNET

Stack Interface Bytes      104M 100% ---10--20--30--40--50--60--70--80--90--
TCPIP11-OSA1      56.1M  54% ████████████████████████████████████████
TCPIP11-OSA2      48.4M  46% ████████████████████████████████████████
Indeterminate      132   <1% ████████████████████████████████████████

Application Traffic Statistics through stack: TCPIP11
Time      Packets In      Packets Out      Bytes In      Bytes Out
Stk%      Amount      Stk%      Amount      Stk%      Amount      Stk%      Amount
12.21     77%      3241     73%      3700     58%      159k     69%      1886k
12.20     85%      3131     85%      3545     73%      153k     85%      1796k
12.19     81%      3092     78%      3614     70%      152k     74%      1785k
12.18     88%      3201     89%      3679     78%      157k     97%      1917k
12.17     84%      3281     82%      3794     72%      161k     88%      2029k

12.20     84%      15734    83%      18095    73%      772k     85%      9239k
12.15     70%      10709    67%      13103    46%      527k     63%      5524k
12.10     76%      13318    76%      15872    38%      656k     81%      7270k
12.05     74%      15694    73%      18213    32%      774k     84%      9937k
12.00     63%      15017    75%      17575     9%      739k     82%      8673k
11.55     30%      13844    63%      16450     2%      681k     67%      7608k
11.50     61%      12444    76%      15297     8%      613k     81%      6449k
11.45     68%      14774    65%      17238    34%      725k     60%      8294k
11.40     85%      13230    85%      15811    59%      651k     89%      7217k
11.35     81%      14553    80%      17530    52%      715k     89%      8321k
11.30     81%      15511    81%      18398    53%      763k     84%      9218k
11.25     81%      14921    80%      17700    54%      732k     86%      8391k
***** Bottom of data *****
    
```



# Which Applications Use Which Interface

DENM44----- TCP/IP : Application Traffic Statistics -----12.24.24 TCPIP11  
Command ==> \_ Scroll ==> CSR

Application	End Time	---Bytes---		--Stack%--		--Packets--		--Stack%--	
		In	Out	In	Out	In	Out	In	Out
OSA1-jartest	12.25	30034	57728	2%	<1%	387	210	2%	<1%
	12.20	45146	113k	4%	1%	674	344	4%	<2%
	12.15	34171	57520	3%	<1%	400	240	3%	1%
	12.10	36406	66608	2%	<1%	460	258	3%	1%
	12.05	30839	39464	1%	<1%	320	207	2%	<1%
	12.00	36094	66608	<1%	<1%	456	258	2%	1%
	11.55	32171	49808	<1%	<1%	355	227	<1%	<1%
	11.50	35822	69332	<1%	<1%	453	263	2%	1%
	11.45	28727	29968	1%	<1%	268	190	1%	<1%
	11.40	30522	38672	3%	<1%	323	204	2%	1%
	11.35	39167	85720	3%	<1%	524	295	3%	1%
	11.30	48134	134k	3%	1%	747	385	4%	2%
	12.25	0	0	0%	0%	0	0	0%	0%
	12.20	0	0	0%	0%	0	0	0%	0%
OSA1-Apollo-11	12.15	0	0	0%	0%	0	0	0%	0%
	12.10	80	0	<1%	0%	2	0	<1%	0%
	12.05	0	0	0%	0%	0	0	0%	0%
	12.00	0	0	0%	0%	0	0	0%	0%
	11.55	0	0	0%	0%	0	0	0%	0%
	11.50	6145	0	<1%	0%	128	0	<1%	0%
	11.45	8575	9599	<1%	<1%	112	13	<1%	<1%
	11.40	0	0	0%	0%	0	0	0%	0%
	11.35	3670	955	<1%	<1%	15	5	<1%	<1%
	11.30	1412	0	<1%	0%	4	0	<1%	0%
	12.25	324	92	<1%	<1%	3	2	<1%	<1%
	12.20	5756	18542	<1%	<1%	68	56	<1%	<1%
	12.15	0	0	0%	0%	0	0	0%	0%
	12.10	0	0	0%	0%	0	0	0%	0%
OSA1-CICS	12.05	0	0	0%	0%	0	0	0%	0%
	12.00	0	0	0%	0%	0	0	0%	0%
	11.55	0	0	0%	0%	0	0	0%	0%
	11.50	0	0	0%	0%	0	0	0%	0%
	11.45	0	0	0%	0%	0	0	0%	0%
	11.40	0	0	0%	0%	0	0	0%	0%
	11.35	0	0	0%	0%	0	0	0%	0%
	11.30	0	0	0%	0%	0	0	0%	0%
	12.25	0	0	0%	0%	0	0	0%	0%
	12.20	0	0	0%	0%	0	0	0%	0%
	12.15	0	0	0%	0%	0	0	0%	0%
	12.10	0	0	0%	0%	0	0	0%	0%
	12.05	0	0	0%	0%	0	0	0%	0%
	12.00	0	0	0%	0%	0	0	0%	0%



# Backlog Rejects

CSNM30----- TCP/IP Performance : Address Space Attribute List -----CA31  
Command ==> \_ Scroll ==> CSR

Resource ID ..... CSNM30  
Description ..... test  
Current Alerts ..... 0

.=Expand-Collapse D=Samples S/=Summary H=Hours DL=Days W=Weeks UA=UpdAlrt

Qualifier/Attribute		Alerts		Samples	Last Sample	Value Type	
		Open	Total				
TCPIP31-TCP(2636)			0	36	16:32		
AsActiveByPort			0	4	16:32	0	GAUGE
AsBytesInByPort			0	4	16:32	0	COUNT
AsBytesOutByPort			0	4	16:32	0	COUNT
AsConnectsByPort			0	4	16:32	0	COUNT
BacklogByPort			0	4	16:32	0	GAUGE
BacklogRejectsByPort			0	4	16:32	0	COUNT
ListenerCount			0	4	16:32	1	GAUGE
ListenerSEF			0	4	16:32	100	GAUGE
PortStatus			0	4	16:32	LISTEN	ENUM
TCPIP31-TCP(3036)			0	36	16:32		
AsActiveByPort			0	4	16:32	0	GAUGE
AsBytesInByPort			0	4	16:32	0	COUNT
AsBytesOutByPort			0	4	16:32	0	COUNT
AsConnectsByPort			0	4	16:32	0	COUNT
BacklogByPort			0	4	16:32	0	GAUGE
BacklogRejectsByPort			0	4	16:32	0	COUNT
ListenerCount			0	4	16:32	1	GAUGE
ListenerSEF			0	4	16:32	100	GAUGE
PortStatus			0	4	16:32	LISTEN	ENUM

\*\*END\*\*



# Backlog Rejects

CSNM30----- TCP/IP Performance : Sample Hourly Rates Graph -----CA31  
Command ==> \_ Scroll ==> CSR

Resource ID ..... CSNM30  
Qualifier ..... TCPIP31-TCP(2636)  
Attribute ID (Type) BacklogRejectsByPort (COUNTER)  
Description ..... Connections rejected due to backlog exceeded  
Total Alert Count ... 0  
Period ..... 41mins : Tue 20-Jul-2010 from 16:27 to 17:08

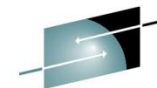
Axis range is 1 to 10.8, each 5 points is 1

Sample Time	Rate	Axis
Daily baseline	◇	1
Tuesday baseline	◇	2
17:08	0 ◇	3
17:07	0 ◇	4
17:02	0 ◇	5
16:57	0 ◇	6
16:52	0 ◇	7
16:47	0 ◇	8
16:42	0 ◇	9
16:37	0 ◇	10
16:32	0 ◇	
16:31	0 ◇	
16:28	0 ◇	
16:27	- ◇	

\*\*END\*\*



# TCP Dropped Connections



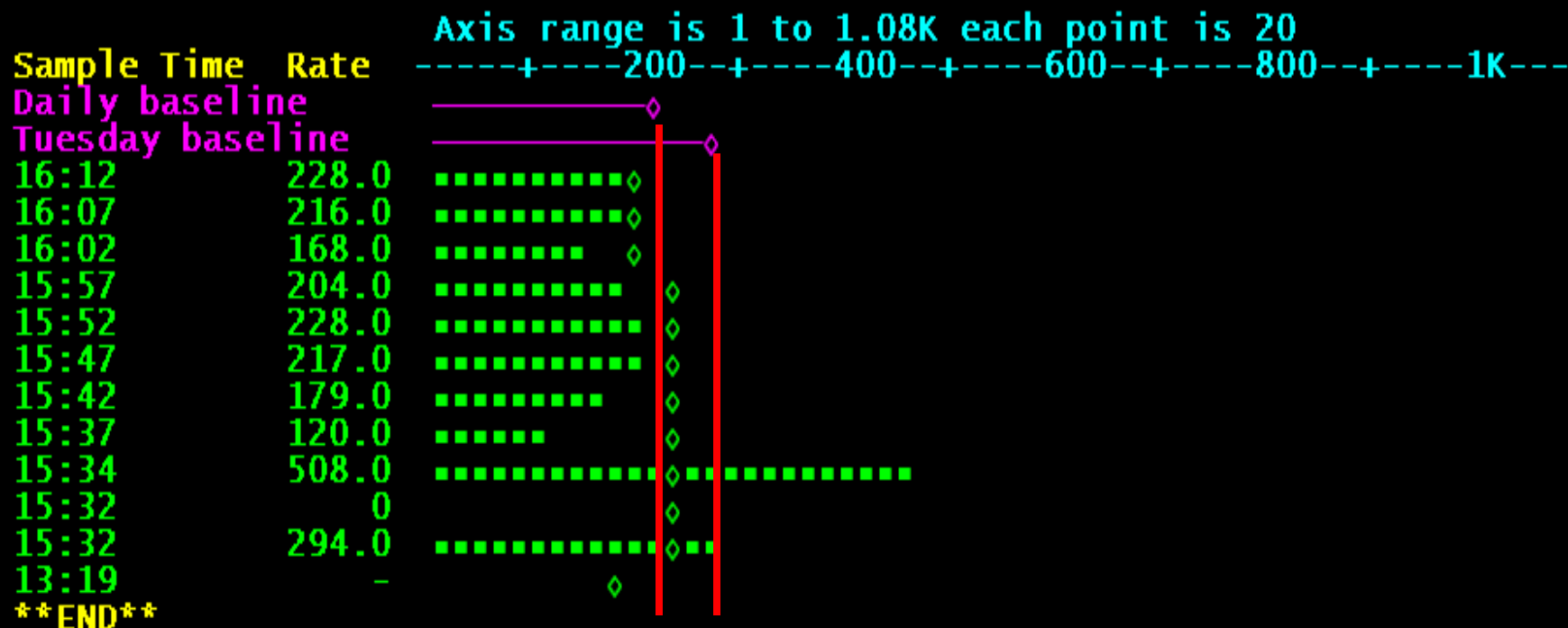
SHARE

Technology • Connections • Results

CSNM30----- TCP/IP Performance : Sample Hourly Rates Graph -----CA31

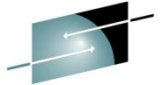
Command ==> \_ Scroll ==> CSR

Resource ID ..... TCPIP31  
Description ..... tcpip31  
Attribute ID (Type) tcpDroppedConns (COUNTER)  
Description ..... TCP connections dropped  
Total Alert Count ... 0  
Period ..... 2hrs 53mins : Tue 20-Jul-2010 from 13:19 to 16:12





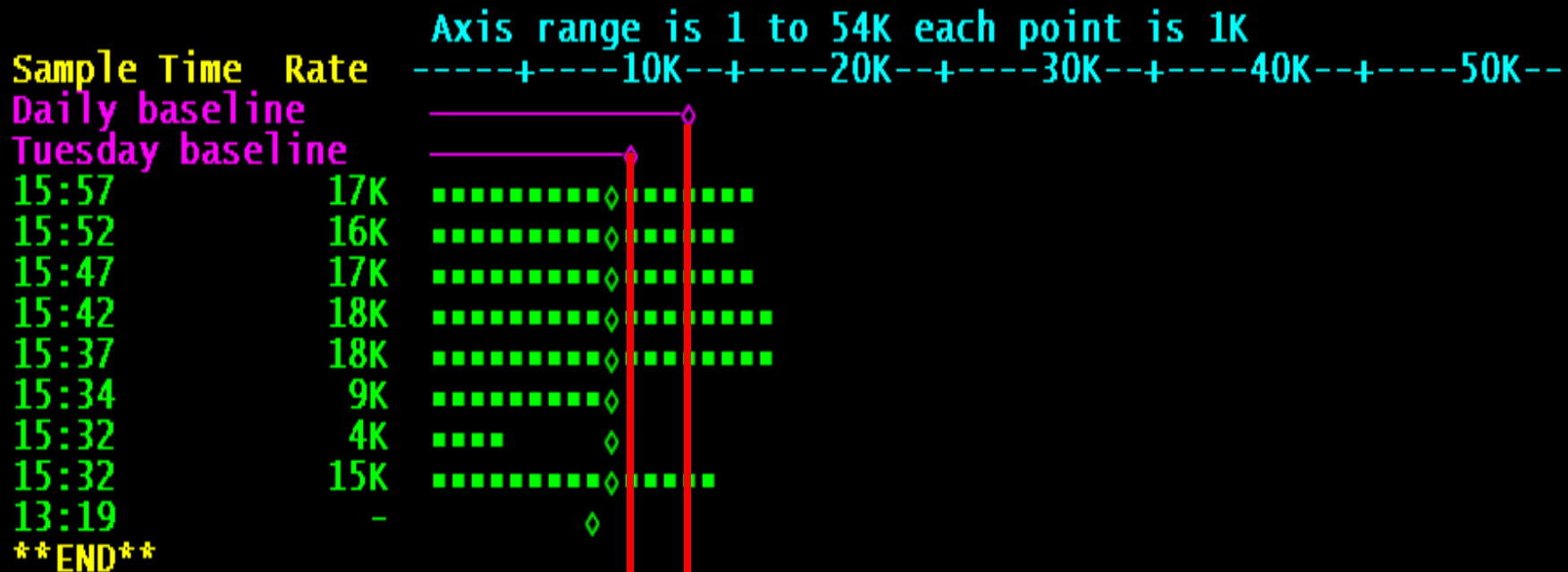
# TCP Connections



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CSNM30----- TCP/IP Performance : Sample Hourly Rates Graph -----CA31  
Command ==> \_ Scroll ==> CSR

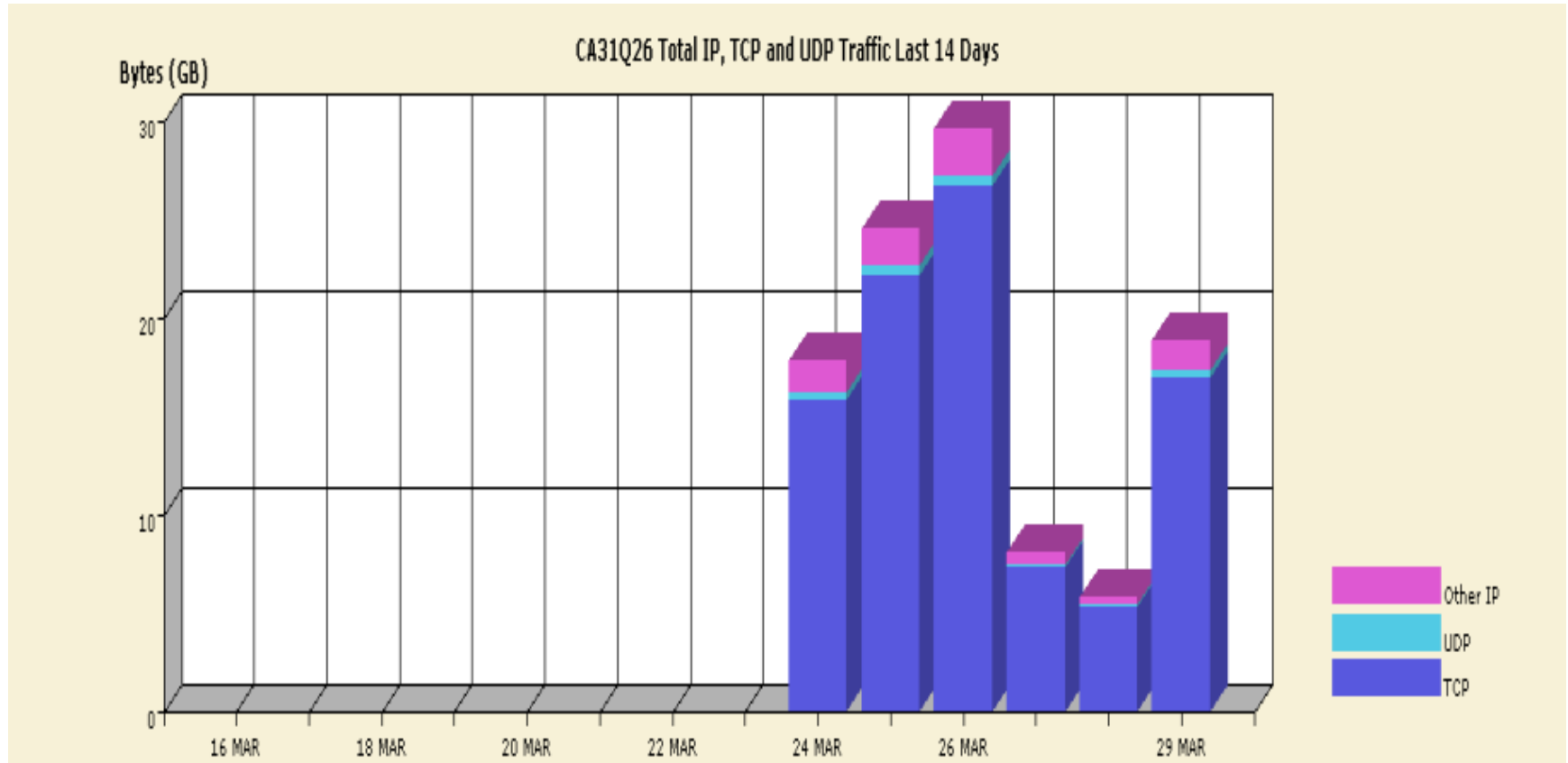
Resource ID ..... TCPIP31  
Description ..... tcpip31  
Attribute ID (Type) ConTotalConnects (TOTAL)  
Description ..... Connections for stack  
Total Alert Count ... 0  
Period ..... 2hrs 38mins : Tue 20-Jul-2010 from 13:19 to 15:57





# Normal Patterns - Total IP, TCP and UDP traffic

## Use Reporting structures





# Proactive Management – Part of the Plan

**“He who fails to plan, plans to fail”**





# Proactive – Use TCP Metrics

CSNM30----- Stack IP Performance Metrics - Help -----Page 2 of 5

Command ==> \_

connections have made a direct transition to the SYN-SENT or SYN-RCVD states from the CLOSED state.

**Connections - Passive Opens** is the number of times TCP connections have made a direct transition to the SYN-SENT state from the CLOSED state.

**Connections - Open Failures** is the number of times TCP connections have made a direct transition to the CLOSED state from the SYN-SENT or SYN-RCVD states.

**Connections - Dropped** is the total number of TCP connections dropped due to the following reasons:

- Retransmit threshold exceeded
- No response while sending window probe requests
- No response while sending keepalive probe requests
- FINWAIT2 timer expiring prior to receiving FIN segment

**Segments - Sent** is the number of TCP segments sent, including those in current connections but excluding those containing only retransmitted octets.

**Segments - Sent with RST Flag** is the number of TCP segments sent that contain the RST flag.

**Segments - Retransmitted** is the number of TCP segments sent that contain one or more previously transmitted octets.

**Segments - Received** is the total number of segments received, including those received in error. This count includes segments received on currently established connections.

**Segments - Received with Errors** is the total number of



# Automate

- Alerts & Events
- Problem Resolution
- Reporting
- Web publishing

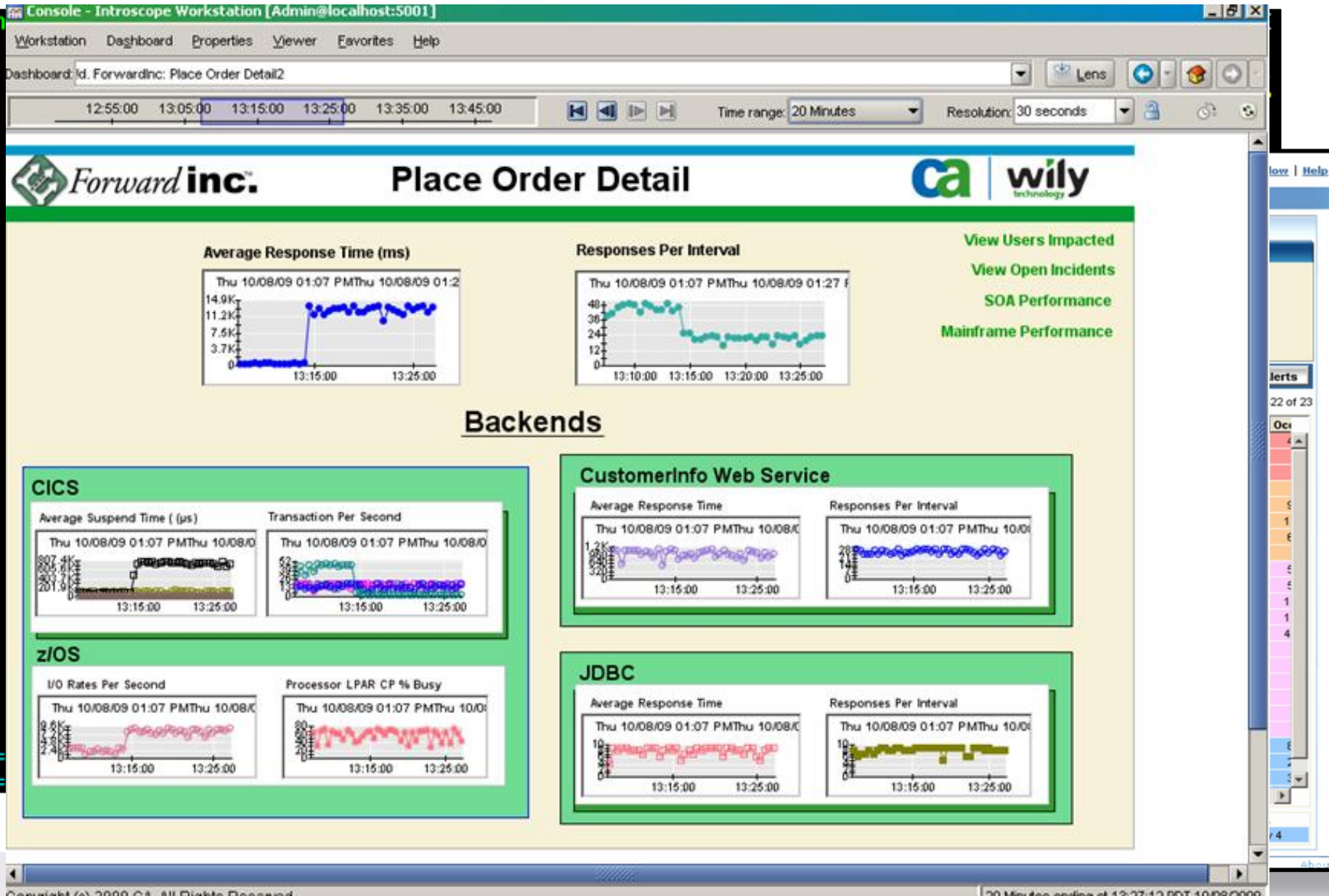




# Automation & Alerting



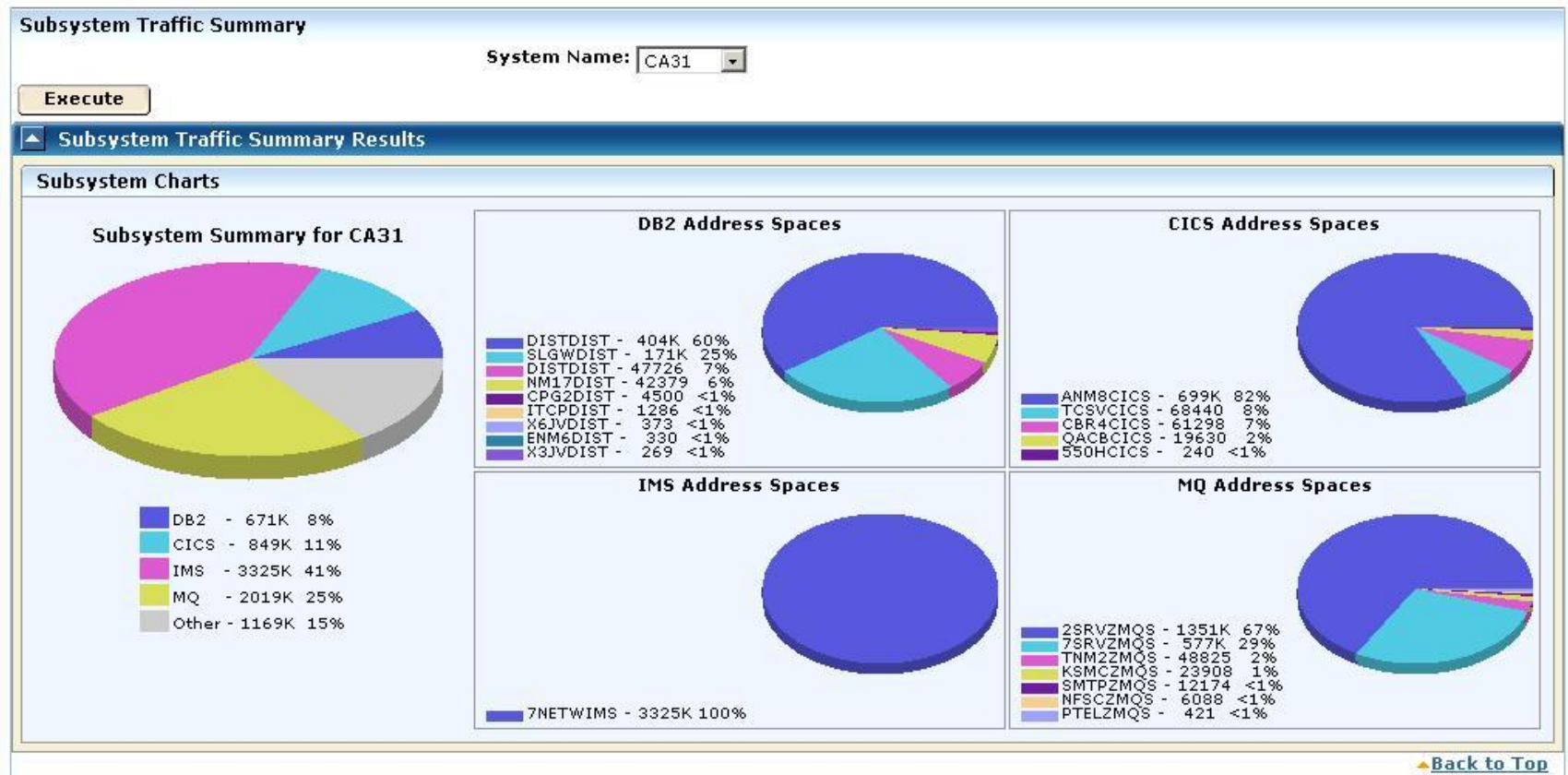
Comm



F1=  
F7=



# Implement Business-Centric Monitoring

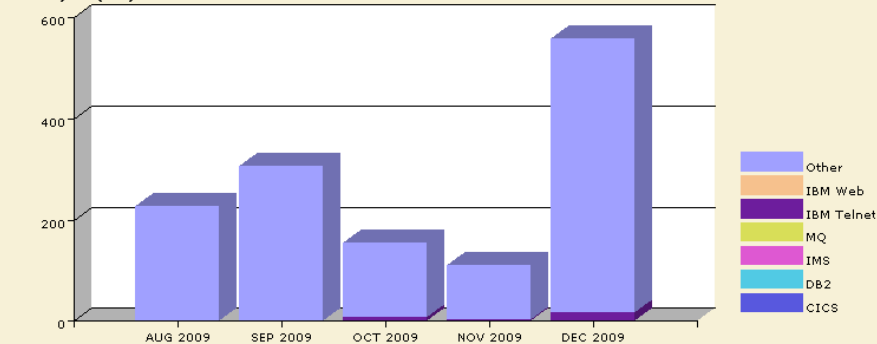




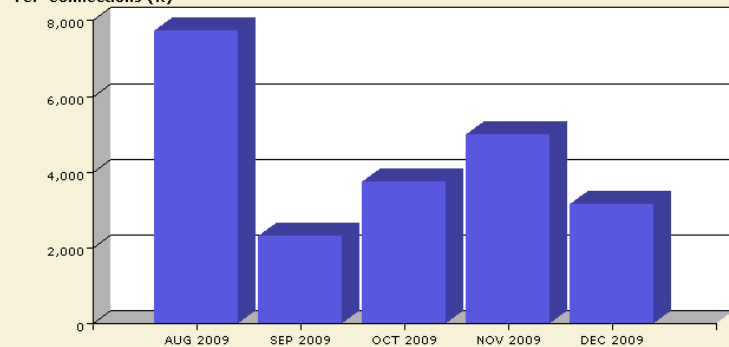
# Planning for Growth

TCP Traffic Growth

CA11 TCP Traffic by Server All Months



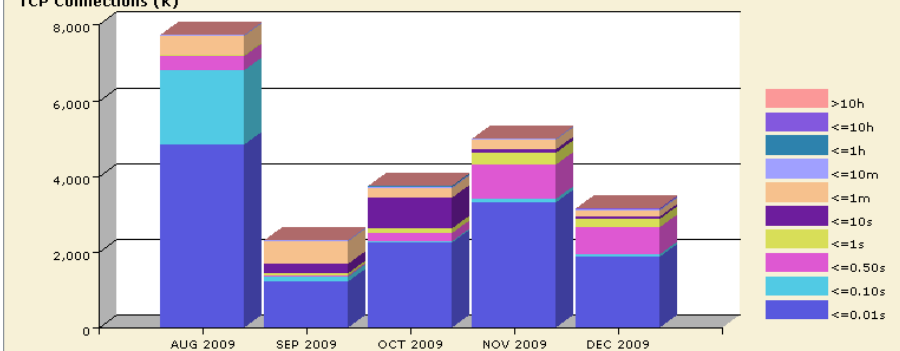
CA11 TCP Connection Counts All Months



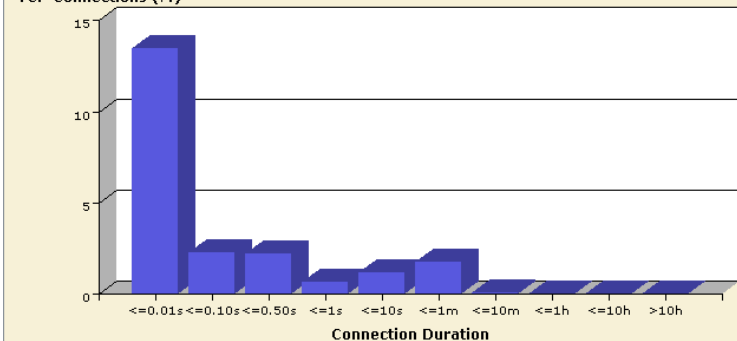
[Show Table](#)

TCP Connection Duration

CA11 TCP Connections by Duration All Months



CA11 Distribution of TCP Connection Duration All Months



[Show Table](#)



# Avoid the blame

- Plan
- Know your business applications
- Understand the relation between the business and the network
- Understand your SLAs
- Manage proactively
- Use tools effectively





## Additional Information

- **7688** *Identifying and Solving Network Performance Problems on the Mainframe and Beyond*
- [Craig.Guess@ca.com](mailto:Craig.Guess@ca.com)



- Thank You  
Q & A