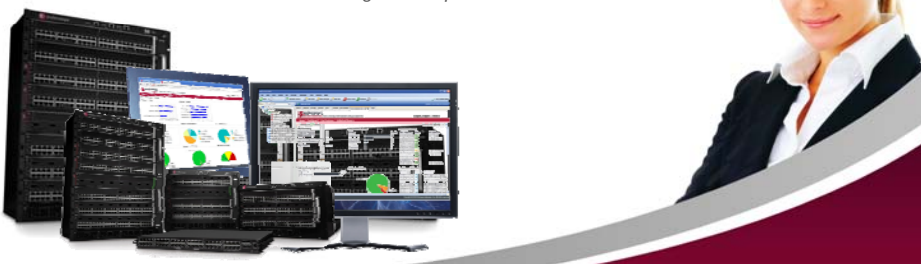




"There is nothing more important than our customers"



Visibility & Control on the Campus LAN

A Siemens Enterprise Communications Company

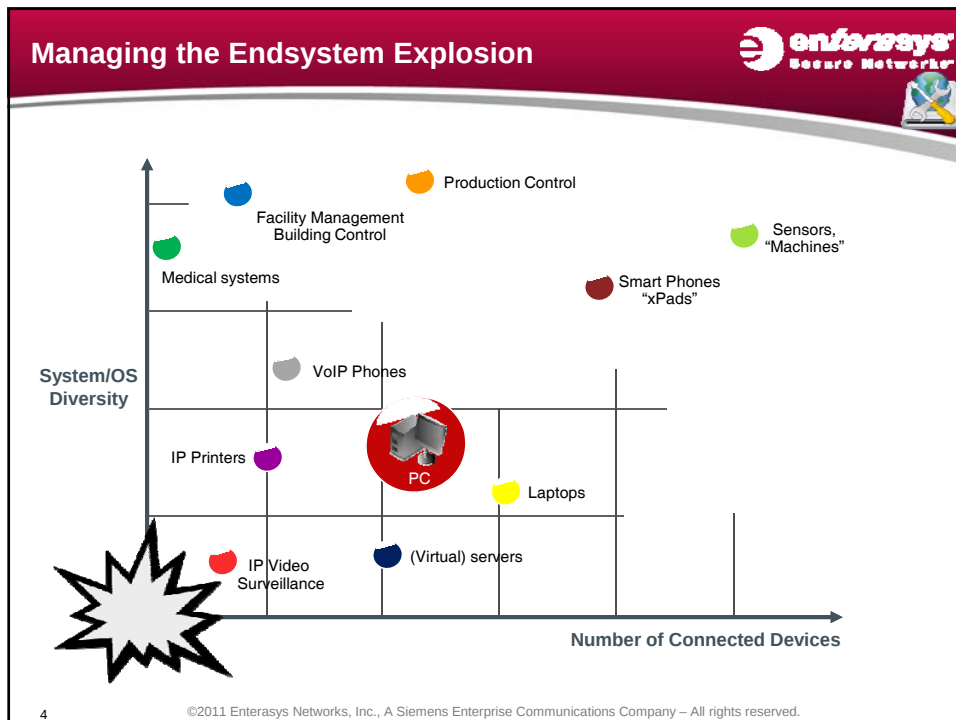
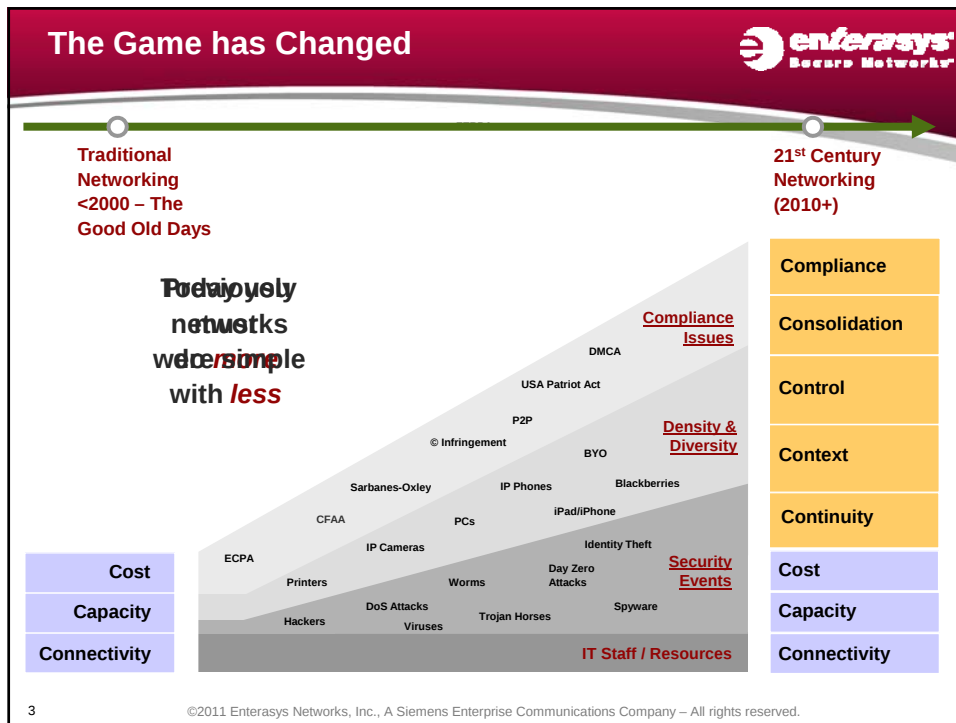
Expectations from the network infrastructure today



USER 	▪ Seamless application access - Across any access technology – wired, wireless and remote - <i>Using any device – laptop, desktop, mobile phone, game console</i> - Reliable and fast access 
ADMINISTRATOR 	▪ Automation, visibility and control - Reduce complexity and number of tools to manage mixed wired / wireless access networks - Automated detection and service provisioning for users and endsystems accessing the network - User-centric management & endsystem, application awareness 
EXECUTIVE 	▪ Aligned with business objectives - Optimize CAPEX & OPEX - Support the business with a agile and reliable infrastructure 

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The Challenge with "BYO"



- **Bring your own PC (BYO) programs are becoming increasingly popular today**
 - Allows individuals to work from the device of their choice
 - Increases employee/user satisfaction
 - Lowers IT costs
- **Various types of devices**
 - Bring your own (BYO) iPhone, iPad, tablet, netbook, smartphone
- **Higher security and management challenges even corporate devices are used**
 - private and sensitive corporate data reside together on a single device
 - "Apps" that get typically installed on today's smartphones and Pads are not controllable
 - so this opens a huge backdoor into today's enterprise IT infrastructures.
 - Variety of hardware and software platforms must be supported
 - Restricting the use of additional "apps" on the devices via organizational rules is not really a workable solution
 - If one does so the value of these new devices to the employee is suddenly very limited

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Access Layer Concerns



Limited Visibility at the Access Layer

- The devices connected to the network
 - Users
 - Headless IP devices
- Location of each device – switch, port, AP, SSID
 - Trusted area
 - Restricted area
- The access controls applied to each device/user
 - IP Phone role
 - Enterprise user – IT, Faculty, HR, etc
 - Guest
 - Restricted Contractor
 - Quarantine
- Security state



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Application Layer Concerns



Limited Visibility at the Application Layer

- The devices connected to the network
- What/who is using the bandwidth?
- Which device is running prohibited applications?
- How to secure the cloud?
 - Dash to connectivity



How to reconcile this information with the network?

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Where to start....



Automated profiling and device type detection

- Detect new devices on the infrastructure automatically and profiles them to determine the type of device
- Various sources such as
 - network and agent based assessment
 - DHCP OS fingerprinting
 - captive portal especially on WLAN(used for remediation and registration, guest services)
 - and external profilers (via Netflow, IDS Signatures, VA Scanners) can be used.
- The Device type can be an Operating System Family, Operating System or Hardware Type, for example, Windows, Windows 7, Debian 3.0, HP Printer, iPhone, iPad etc.



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Where to head....



- The information already exists to gain visibility and control on virtually ANY network.
- Mappings:
 - Switches care about Layer 2 – Source MAC
 - Routers, Firewalls, IDS/IPS care about Layer 3 – Source IP
 - Directory services care about objects – Account names
 - Human beings care about the who is the user....
- Map these items together – Authentication (802.1x & MAC), DHCP listening & Kerberos snooping.

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What can be achieved....



End-Systems								
	MAC Address	IP Address	Switch IP	Switch Port	State	Username	Hostname	Operating System
1	APPLE:4F:7D:C4	192.168.60.11	192.168.100.220	AP3610-1 (00-1A-E8-14-A1-49)UKRTC-NAC	Accept			iPhone/iPad/iPod
2	DELL INC:2B:93:9F	192.168.100.250	fe.1.37		Accept		ymhost.ukrtc.com	
3	DELL INC:EF:F7:C2	192.168.90.11	192.168.100.250	fe.1.22	Accept		kCOMMAV.XP1	
4	INTEL INC:31:E1:29	192.168.200.10	192.168.200.250	fe.1.2	Accept	UKRTC:julian	mgmt.ukrtc.com	Windows Vista SP2
5	SIEMENS :23:7E:09	192.168.210.10	192.168.200.250	fe.1.2	Accept		0641030000183237e09	
6	IBM CORP:4C:1A:AE	192.168.200.13	192.168.200.250	fe.1.5	Accept	UKRTC:Admin	xp-client1.ukrtc.com	Windows XP SP2
7	INTEL CO:49:90:39	192.168.82.11	192.168.100.220	AP3610-1 (00-1A-E8-14-A1-49)UKRTC-NAC	Accept		RG049	Windows
8	INTEL CO:3D:CF:51	192.168.100.250	192.168.100.250	fe.1.12	Accept			
9	DELL INC:C8:57:8D	192.168.100.40	192.168.100.250	fe.1.44	Accept			
10	INTEL CO:07:C1:0A	192.168.100.50	192.168.100.250	fe.1.36	Accept		demo-dragon.ukrtc.com	
11	INTEL CO:A8:0C:AD	192.168.100.110	192.168.100.250	fe.1.21	Accept		tag.ukrtc.com	
12	HTC CORP:B7:6B:89	192.168.100.220	192.168.100.220	00-1A-E8-10-1F-39UKRTC-NAC	Error			HTC Touch
13	INTEL CO:08:E1:E4	192.168.100.170	192.168.100.250	fe.1.20	Accept			
14	ASKEY CO:59:69:A6	192.168.100.220	192.168.100.220	AP3610-1 (00-1A-E8-14-A1-49)UKRTC-NAC	Accept			
15	INTEL CO:BF:EA:13	192.168.100.220	192.168.100.220	AP3610-1 (00-1A-E8-10-1F-39)UKRTC-NAC	Error		SCL-LCR-LAP06	Windows
16	INTEL CO:BF:EA:13	192.168.82.10	192.168.100.220	AP3610-1 (00-1A-E8-14-A1-49)UKRTC-NAC	Accept		DX403ZEC	Windows
17	INTEL CO:25:22:0F	10.10.0.157	192.168.100.220	AP3610-1 (00-1A-E8-14-A1-49)UKRTC-NAC	Accept		RG112	Windows

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What can be achieved...



168	MICRO-ST:8F:7F:73	MICRO-STAR INTL...	10.0.10.29	10.0.9.17	ge.2.43	VERITLIB06	Win
169	HEWLETT :18:3A:25	Hewlett Packard	10.0.5.80	10.0.9.51	ge.3.4		
170	HEWLETT :0E:29:7E	Hewlett Packard	10.0.13.227	10.0.9.17	ge.3.18		
171	ASUSTEK :F3:D8:4A	ASUSTek COMPUT...	10.0.0.58	10.0.9.17	ge.3.21	CLICKVIEW247	
172	MICRO-ST:8F:75:54	MICRO-STAR INTL...	10.0.10.39	10.0.9.17	ge.4.3	VERITLIB09	Win
173	HEWLETT :7B:B9:12	Hewlett Packard	10.0.5.33	10.0.9.17	ge.4.4	NP17B8912	
174	SMA REGE:1E:45:EB	SMA REGELSYST...	10.0.10.0	10.0.9.17	ge.4.6		Win
175	KONICA M:5F:92:E4	KONICA MINOLTA ...	10.0.10.54	10.0.9.17	ge.4.32		
176	APPLE CG:81:CC:52	Apple Computer Inc	10.0.10.54	10.0.9.101	RedN0030 (00-1F-45-7E-6C-E8) RedlandNS	MAC001B63E0B...206032	Mac
176							

End-System Events | Health Result Summaries | Health Result Details

Events for End-System: E4:CE:8F:17:56:14, through 08/06/2011 03:36:00 AM

Timestamp	IP Address	Switch IP	Switch Port	State	Username
13/07/2011 12:22:10 PM	10.0.10.54	10.0.9.101	RedN0030 (00-1F-45-7E-6C-E8) RedlandNS	Accept	206032
13/07/2011 12:22:06 PM		10.0.9.101	RedN0030 (00-1F-45-7E-6C-E8) RedlandNS	Accept	206032
13/07/2011 09:34:37 AM	10.0.10.54	10.0.9.101	RedN0010 (00-1F-45-7E-5B-80) RedlandNS	Accept	206032
13/07/2011 09:34:31 AM		10.0.9.101	RedN0010 (00-1F-45-7E-5B-80) RedlandNS	Accept	206032
12/07/2011 01:47:22 PM	10.0.10.50	10.0.9.101	RedN0050 (00-1F-45-7E-5B-E8) RedlandNS	Accept	206032
12/07/2011 01:47:16 PM		10.0.9.101	RedN0050 (00-1F-45-7E-5B-E8) RedlandNS	Accept	206032
12/07/2011 12:22:13 PM	10.0.10.50	10.0.9.101	RedN0054 (00-1F-45-7E-5A-48) RedlandNS	Accept	206032
12/07/2011 12:22:06 PM		10.0.9.101	RedN0054 (00-1F-45-7E-5A-48) RedlandNS	Accept	206032
12/07/2011 09:29:16 AM	10.0.10.50	10.0.9.101	RedN0010 (00-1F-45-7E-5B-80) RedlandNS	Accept	206032
11/07/2011 09:27:58 AM	10.0.10.43	10.0.9.101	RedN0010 (00-1F-45-7E-5B-80) RedlandNS	Accept	206032
11/07/2011 09:27:52 AM		10.0.9.101	RedN0010 (00-1F-45-7E-5B-80) RedlandNS	Accept	206032
11/07/2011 09:27:50 AM		10.0.9.101	RedN0010 (00-1F-45-7E-5B-80) RedlandNS	Accept	206032

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Application Visibility & Control...



- **Flow Analysis (Netflow, Sflow, Jflow)**
 - Commonly supported features give good baseline information
- **Application Layer flow analysis via span ports (mirroring), network taps and inline devices**
 - See the whole picture to Layer 7
- **Don't Forget your Virtual Machines....**
 - Whole new hidden world contained within the virtual switch
- **Usage can be dynamically mapped back to the user**



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The Ultimate BYO Network



- QUESTnet ☺



Queensland
Education,
Science & Technology
Network



- WLAN, Vendor Network, AV network, Network Management LAN
- A few choice pieces of information.....
 - 1.8 Million flows per day
 - 33 Unique conversations per second

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QUESTnet...



- Yesterday afternoon over half of all bandwidth consumed was done by....

BitTorrent

Top Applications (Total Bytes)

Zoom: max 2011-Jul-13, 10:58 - 16:58

■ Remainder

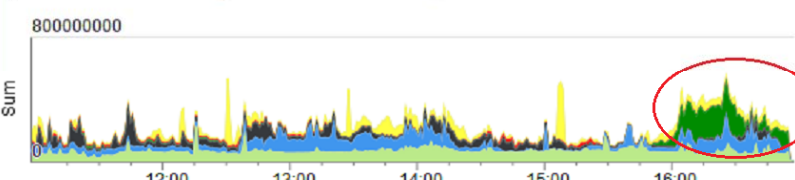
■ Web.SecureWeb

■ other

■ SecurityProtocol.IPS...

■ P2P.BitTorrent

■ Web.Miso



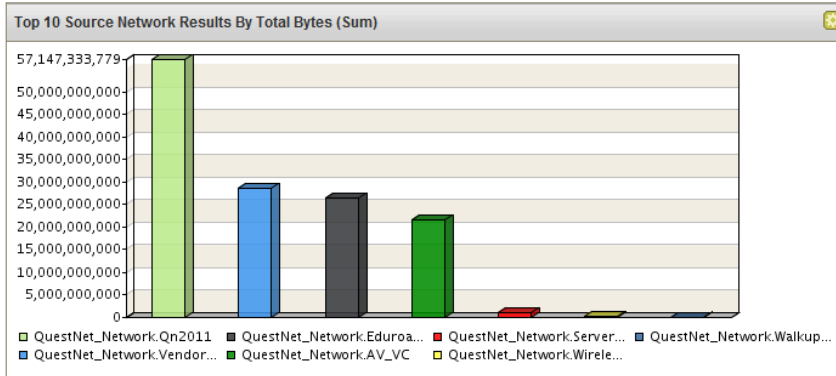
[View in Network Activity](#)

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QUESTNet



▪ Busiest Network segment....



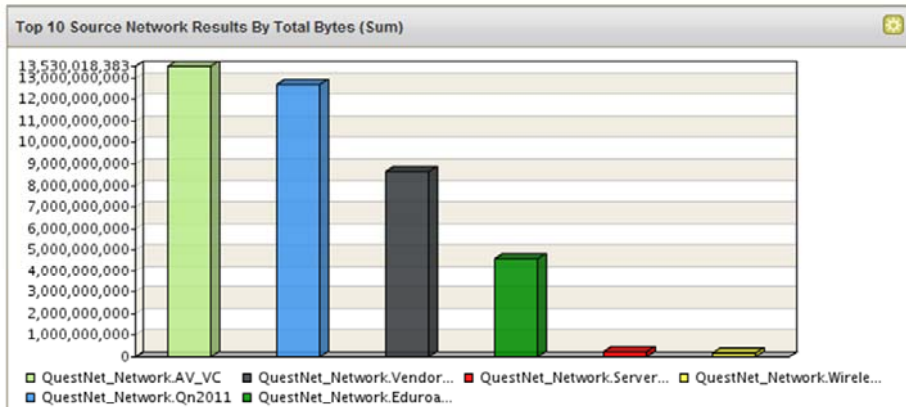
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QUESTNet



▪ Strip out web browsing and.....



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A new way to control?



- **The concept of cloud is being embraced.....**
 - Why not leverage to assist in network management & control?
 - Intelligent Socially Aware Automated Communications (isaac)



**Humanize
the Enterprise™**

Meet isaac, the industry's first social media interface that connects your IT network with your social network

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isaac



- **Over 1 Billion people use social media....**
 - When secured properly use this platform to enable control from anywhere through Twitter, Facebook, LinkedIn and Salesforce.com
- **Isaac offers a new workflow paradigm**
 - Traditional concept of helpdesk support procedure can be redefined

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isaac

- **Tweets from key infrastructure giving**
 - Device Health and Status
 - System Alerts
- **Tweet to infrastructure to**
 - Find User
 - Report utilisation
 - Output distilled through existing web solutions....

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Find User X and Map

Show Current Utilisation

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Summary



■ Automation

- Automate Visibility and Control – The information already exists in several disparate systems. Use tools to join the dots...
- Granular control of access increased security for unmanaged, unmanageable and private/BYO devices on the network

■ Reduced cost

- Leverage the efficiency gains through new and innovative devices
- Reduced OPEX through automated service provisioning
- No dedicated infrastructure required
- Leverages the same technology as for any other device access control