

The New Service Paradigm of Internet Access at QUT

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CRICOS No. 00213J

History of IAS at QUT

- First introduced at QUT in the late 1990's to manage demand.
- Early implementations relied on proxy log processing and browser config (proxy.pac)
- Use of Socks service to meter non-www traffic.
- Significant amount of the system was in-house developed.



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History of IAS at QUT

- 2003 saw a new system installed.
 - Implemented a quota (demand management) for all traffic types.
 - Activation via web based pop-up.
 - Basic reporting of user usage.
 - Service activated via same mechanism



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Why IAS ?

- Budgets are a significant driver
 - Look to the Unmetered Wireless Access trial:-



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Why Upgrade AGAIN ?

- Address Service Issues:-
 - Vendor support is an issue for the current system.
 - Pop-up is the scourge of all Hand-held devices.
 - Accounting for non-QUT usage (Eduroam).
 - Restrictive metering options means not being able to easily take advantage of AARNet initiatives such as :-
 - Unmetered Off-Peak (8:00pm – 8:00 am) is not tracked.



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Why Upgrade AGAIN ?

➤ **We have an Internet Access Service for reasons beyond budgets:-**

➤ Research, learning and growth, content delivery, collaboration, telecommuting, conferencing, etc.

➤ **Reporting “The Data we don’t have!” is the most compelling:-**

➤ Why individual students go over quota?

➤ What were they doing to go over quota?

➤ When (time) and where (wireless, wired) were they consuming quota?

➤ Are there places where Internet access should not be available?



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Why Upgrade AGAIN ?

By ignoring the data we don’t have, are we falling for selection bias???

➤ Are we impacting learning and growth?

➤ Abraham Wald provides us with a graphical example of selection bias. During WWII, he studied the vulnerability of aircraft to enemy fire.



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Why Upgrade AGAIN ?



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Why Upgrade AGAIN ?



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Why Upgrade AGAIN ?

All available data suggested that some parts of the aircraft were hit, disproportionately, more often than others.

➤ Air ministry came to the conclusion that these parts should be reinforced?

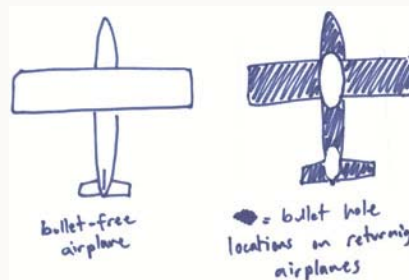


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Why Upgrade AGAIN ?

Abraham Wald did a simple plot to graph bullet hole damage to returning aircraft.



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Why Upgrade AGAIN ?

Abraham Wald came to the opposite conclusion, that parts hit less often should be reinforced.



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IAS Selection Bias

The data you don't have may tell as important a story as the data you do have.

Currently we use **downloaded volume** as the only metric?

There is no research / investigation into what or why they have exceeded their quota.

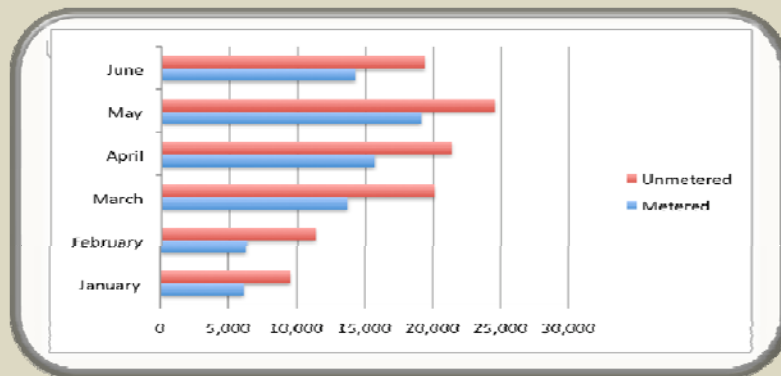


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IAS Selection Bias

- Tracking Metered and Unmetered use.



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IAS Selection Bias

- Tracking Metered and Unmetered use.

We do not currently track unmetered use:-

- What on-net traffic are they consuming?
- What sites are they visiting?
- What services are they using?



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IAS Selection Bias

- Don't assume all students have equal quota needs.



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IAS Selection Bias

- Don't assume all clients have equal quota needs.

➤ Current Quota Allocation:

- Undergrad 500MB
- Post Grad 1000MB
- Staff Unmetered



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IAS Selection Bias

- We need to capture the data we don't currently have:-



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IAS Selection Bias

- We need to capture the data we don't currently have:-

- What are the most visited sites?
- What is the most downloaded application?
- What is the most used application?
- What devices are being used?
- ...



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IAS Selection Bias

- Historically, the Internet Access System at QUT was about metering and managing demand...



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IAS Selection Bias

- Historically, the Internet Access System at QUT was about metering and managing demand...

What's driving this new thinking ???

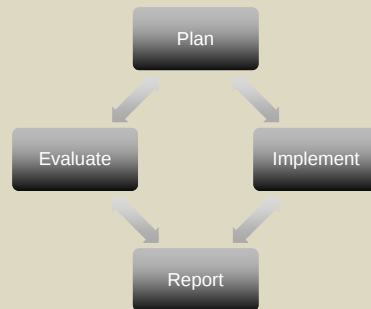


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New Paradigm in IAS at QUT

- QUT's strategic plans focus on the delivery and measurement of services.



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New Paradigm in IAS at QUT

- By capturing this hidden data we can build reports to influence service delivery beyond IAS.



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New Paradigm in IAS at QUT

- By capturing this hidden data we can build reports to influence service delivery beyond IAS.

- Make more informed decisions on quota allocation.
- Improve business intelligence (What are the students doing? What sites are they visiting? etc.)
- Potentially impact business processes (teaching and learning, HR etc.).
- How can this info influence the teaching and learning process?



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New Paradigm in IAS at QUT Business Intelligence

- Many new questions were / are being asked by QUT along the lines of:-

- What are students doing?
- What sites are they visiting?
- What devices are they using?
- Can we offer unmetered Internet use via the wireless network?



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New Paradigm in IAS at QUT

- Don't assume all clients have equal quota needs.

➤ Granular Quota Allocation:

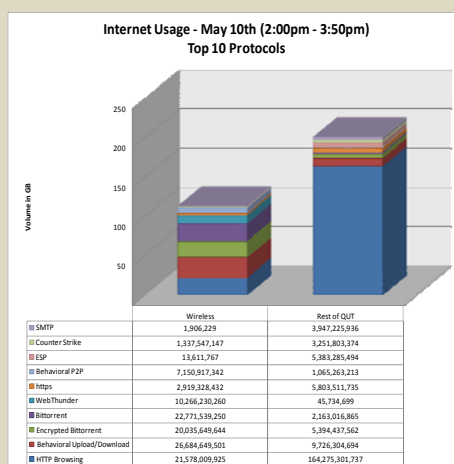
- Allocate quota based on subject / course needs.
- Meter staff for selected off-net traffic.
- Rate Limit guest access.



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New Paradigm in IAS at QUT Reporting



Courtesy of Brian Thompson



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New Paradigm in IAS at QUT Reporting

Days	10					
Network	131.181					
Total Volume In Bytes	Column Labels					
Row Labels	HTTP Browsing	Behavioral Upload/Download	Encrypted Bittorrent	Bittorrent	WebThunder	https
Wireless	21,578,009,925	26,684,649,501	20,035,649,644	22,771,539,250	10,266,230,260	2,919,328,432
131.181.100	3,120,863,771	9,713,158,799	8,693,853,215	6,339,800,507	4,702,761,009	198,854,269
131.181.103	4,014,351,641	3,542,943,825	2,227,143,395	3,039,043,791	2,000,685,442	199,039,508
131.181.18	1,973,853,726	3,488,485,179	1,679,346,013	1,427,085,101	2,267,876,121	131,240,553
131.181.102	2,625,024,223	545,620,177	3,155,215,284	4,986,651,770	468,684	1,081,701,981
131.181.19	2,247,013,684	2,716,042,848	588,411,397	3,463,348,338	104,193,643	478,175,969
131.181.101	2,177,853,587	1,526,900,878	921,863,954	1,614,570,544	537,752,994	720,071,454
131.181.213	1,354,908,162	3,420,686,623	570,768,865	896,251,472	3,247,855	385,157,390
131.181.211	2,198,290,818	147,083,245	1,355,285,443	427,369,125	117,273,209	86,926,924
131.181.212	1,102,254,540	997,653,623	763,186,635	136,618,738	269,697,675	74,749,091
131.181.210	773,583,773	586,268,297	80,585,443	460,799,864	262,432,627	63,410,293
Rest of QUT	164,275,301,737	9,726,304,694	5,394,437,562	2,163,016,865	45,734,699	5,803,511,735
Grand Total	185,853,311,662	36,410,954,195	25,430,087,206	24,934,556,115	10,311,964,959	8,722,840,167

Courtesy of Brian Thompson

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New Paradigm in IAS at QUT Issue - To Rate Limit or Not?

- Counter intuitive initiatives to maintaining quotas:-

➤ QUT is to upgrade the Internet link 1Gig to 10Gig, but will not necessarily increase quota.

➤ Cloud services such as email, external storage etc. Driving up internet usage by clients thus requiring quota.

➤ NBN rollout may potentially mean teaching and learning content can be delivered to the home thus leading to less on campus contact.

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New Paradigm in IAS at QUT Issue - To Rate Limit or Not?

More services into the cloud (Studentconnect) means:-

- More quota requirements.
- Richer course delivery with larger data sets (HD Video).
- More social networking (video conferencing).



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New Paradigm in IAS at QUT To Rate Limit or Not!

Metering may cease to exist and a move to other means of controlling usage will be required. Possible options may include:-

- Protocol / Application Metering:-
 - Rate Limit Counterstrike ☺
 - Filter Limewire

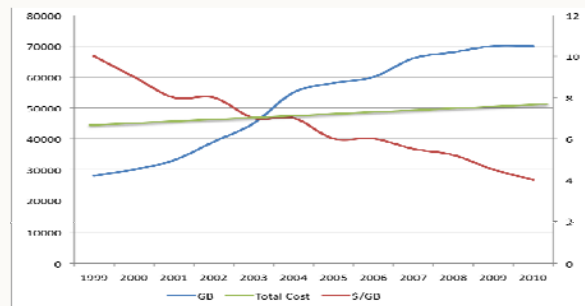


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New Paradigm in IAS at QUT Issue - To Rate Limit or Not?

➤ Changing cost base...



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New Paradigm in IAS at QUT Packaging the Service

- The old paradigm was about metering and rate limiting users when exceeding quota.
- We need better service definition:-

The IAS Service is a collection of systems, applications, services and reporting functions that manages resources and creatively informs the business of use and trends.



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Key objectives when providing a new Internet Access Solution for QUT

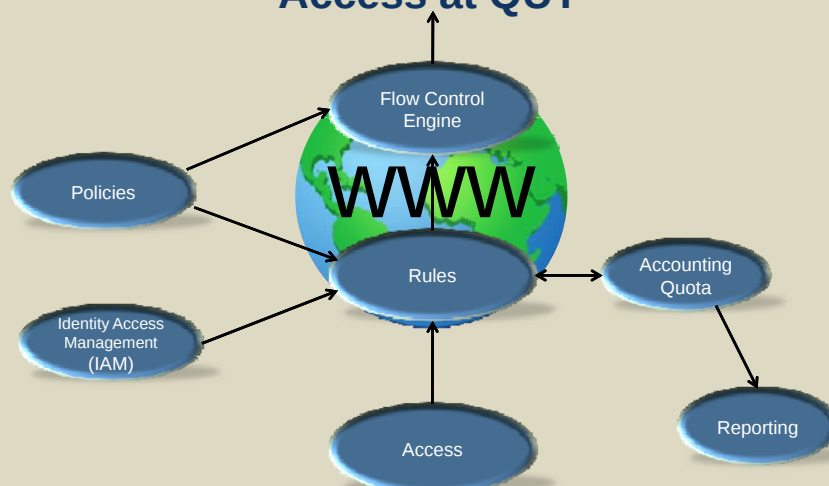
- Provide transparent access to Internet for users
- Flexible student quota
- Must be scalable, reliable and adaptable
- Provide business reporting functions



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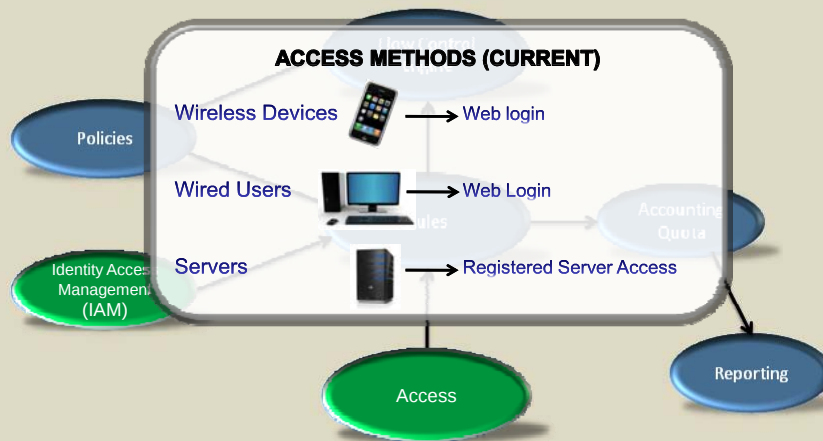
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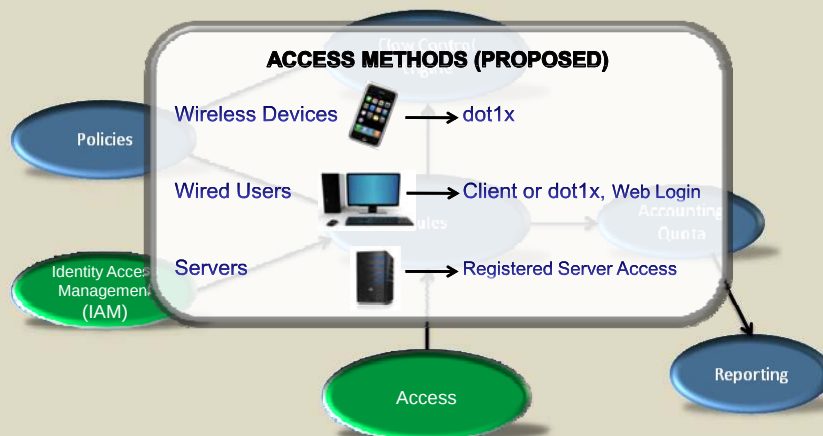
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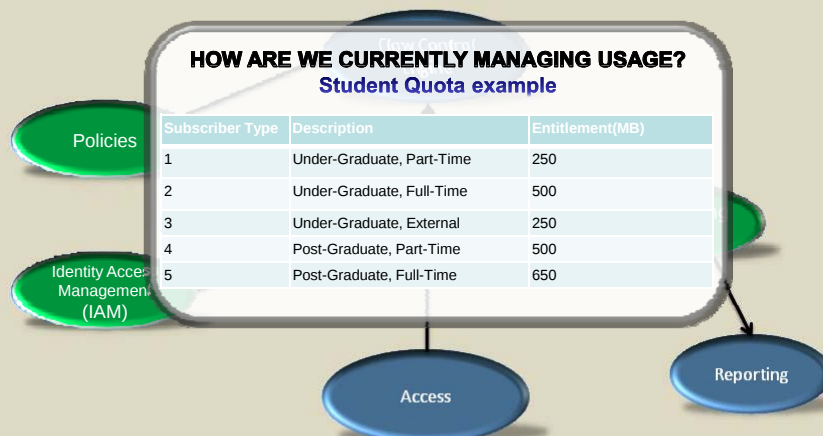
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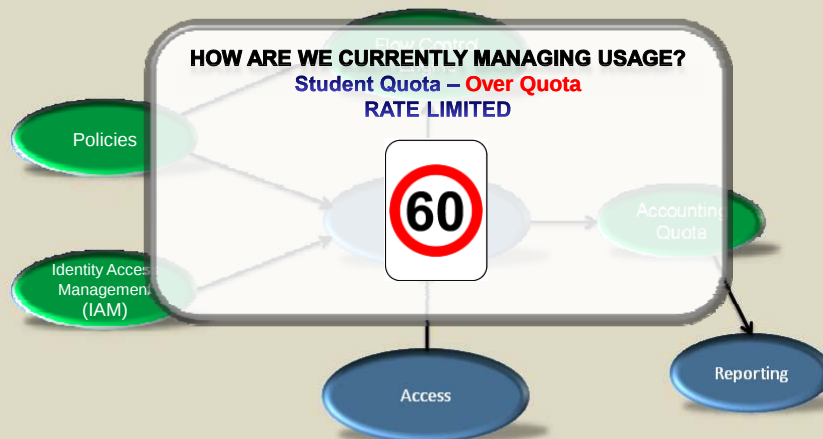
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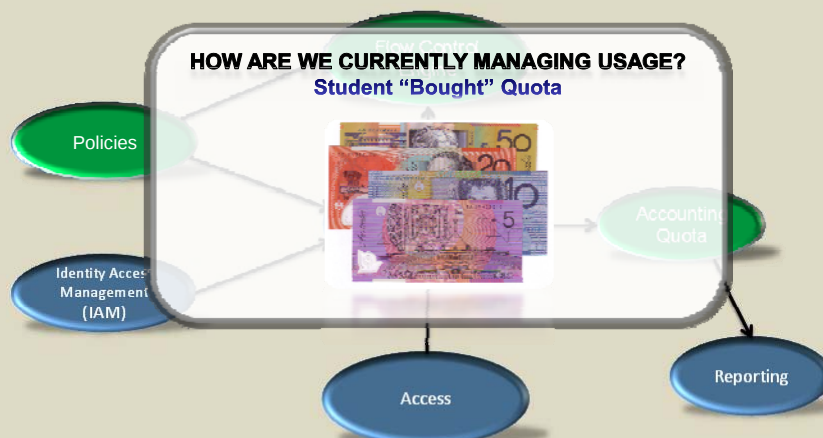
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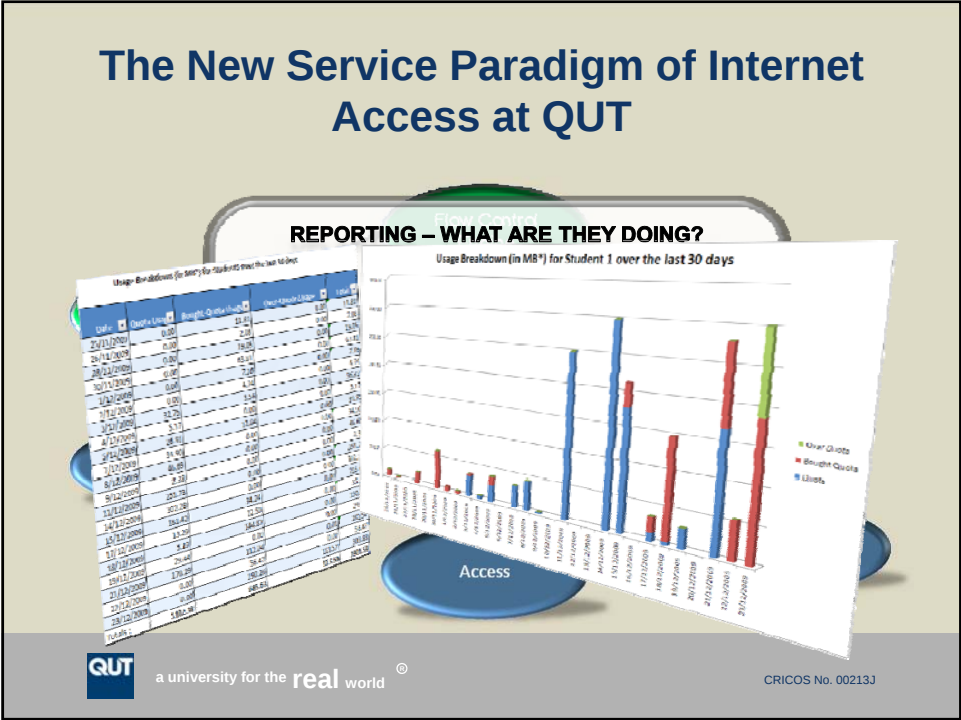
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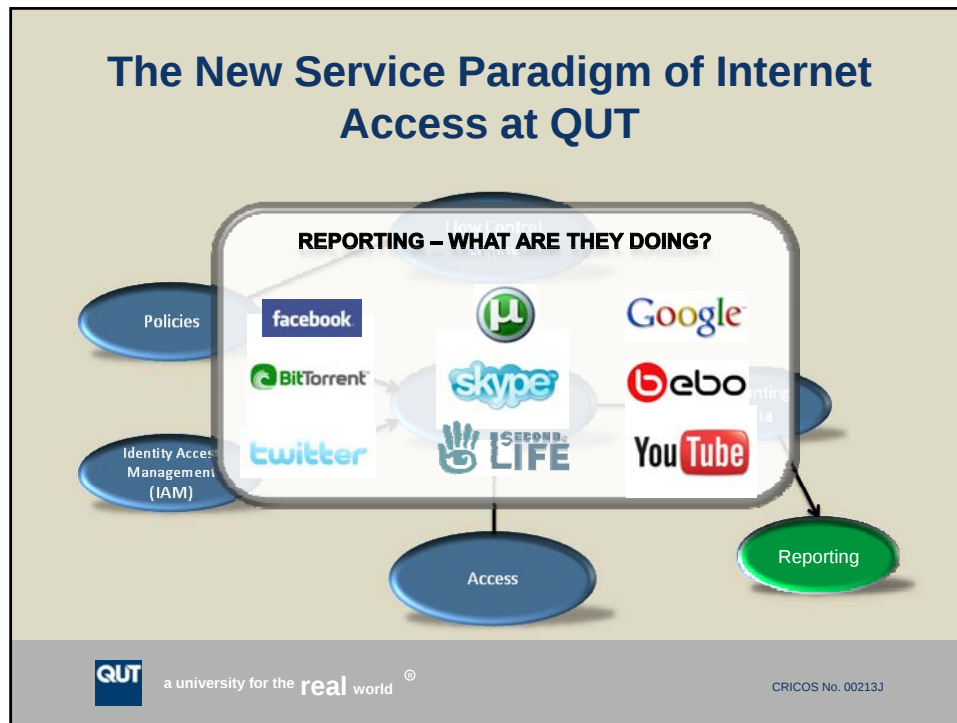


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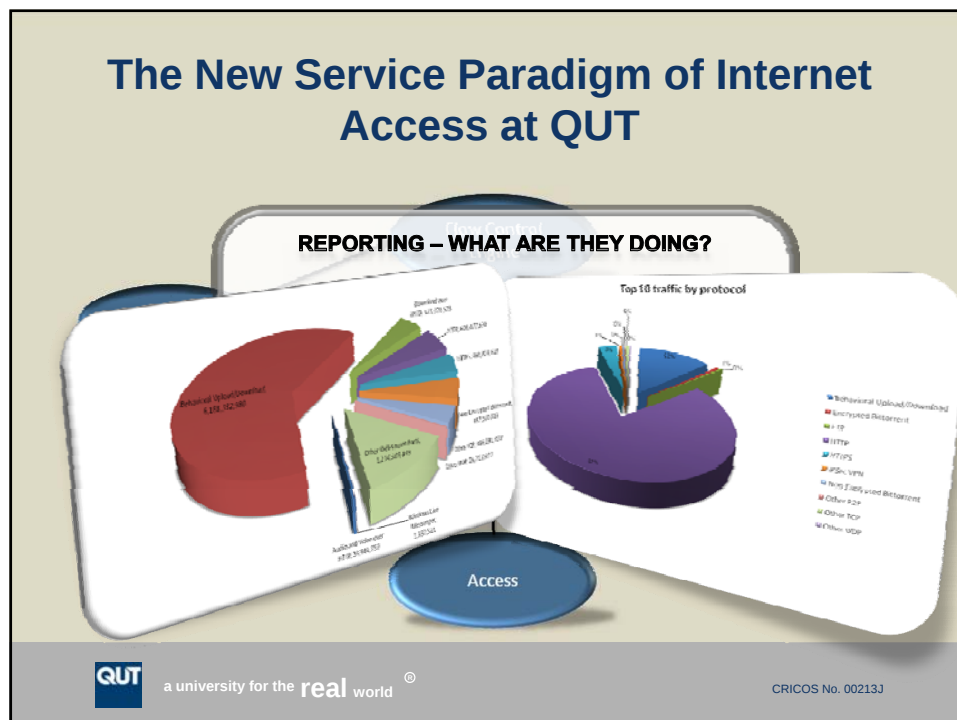




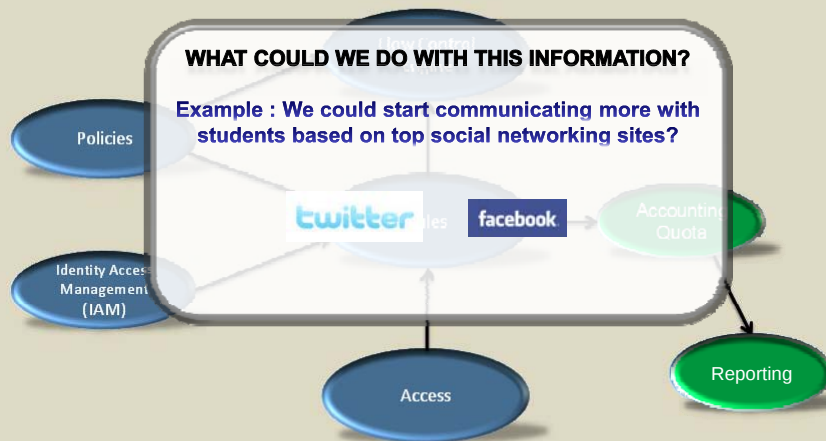
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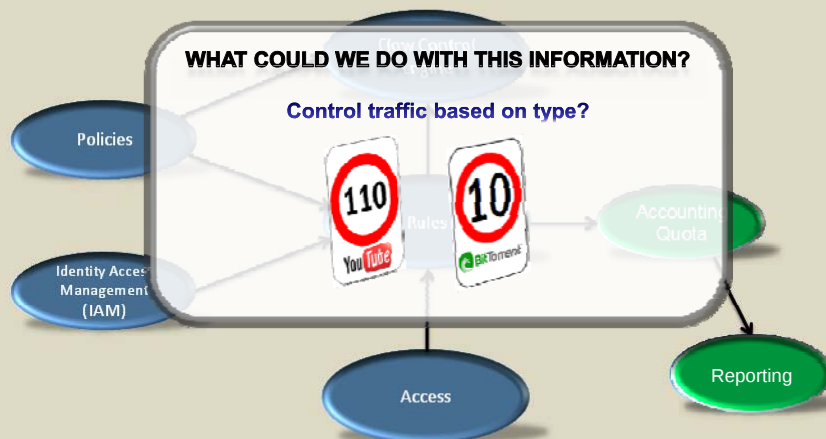
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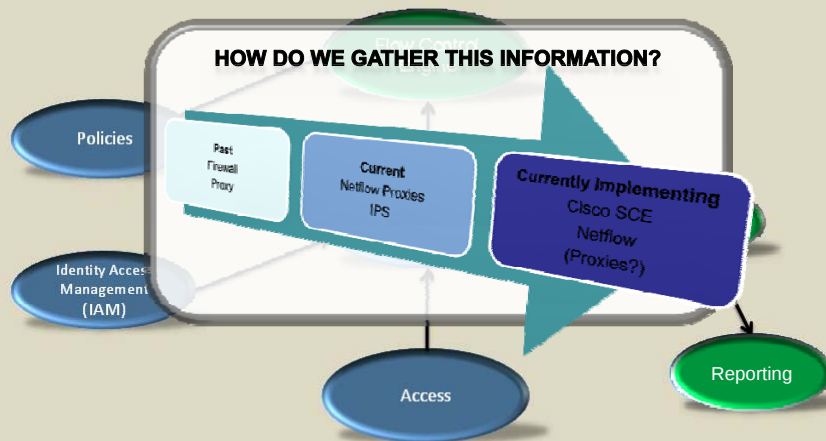
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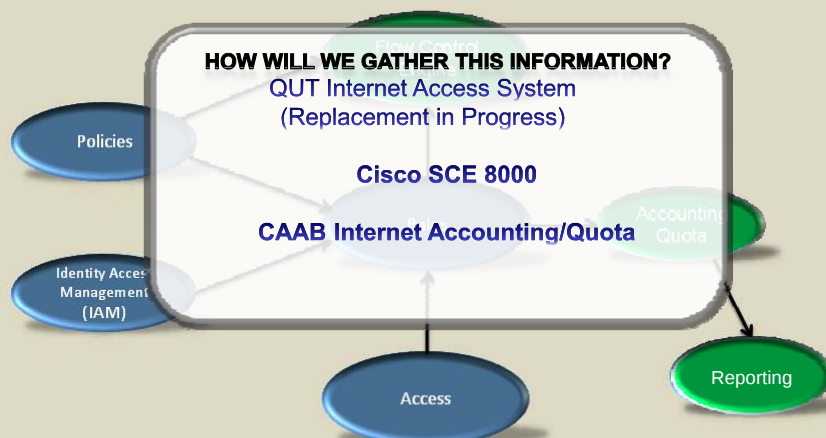
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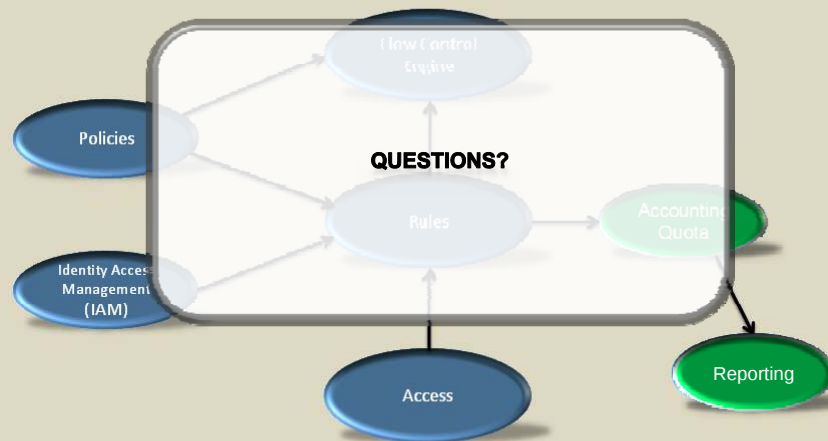
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