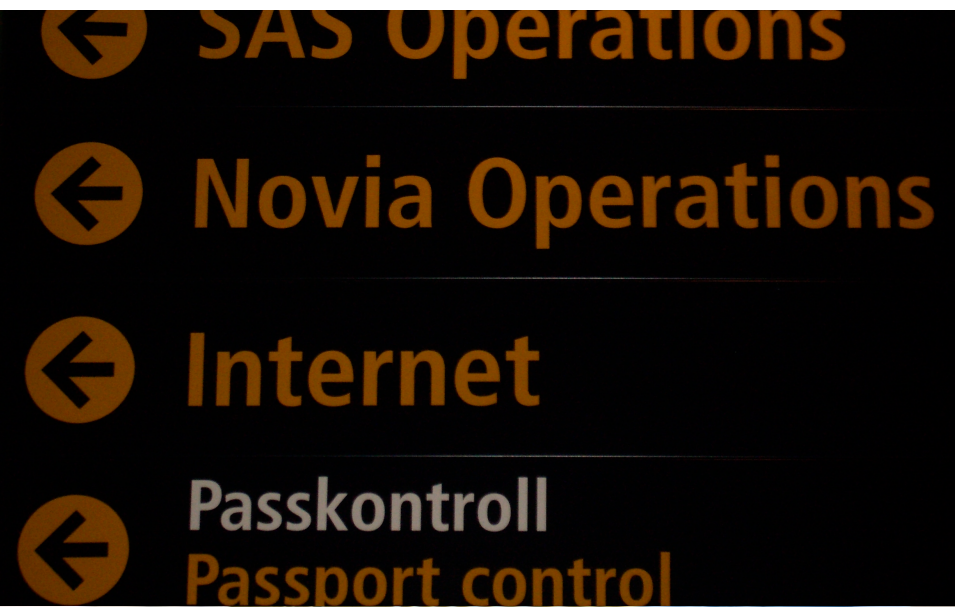


Future Internet



Patrik Fältström paf@cisco.com

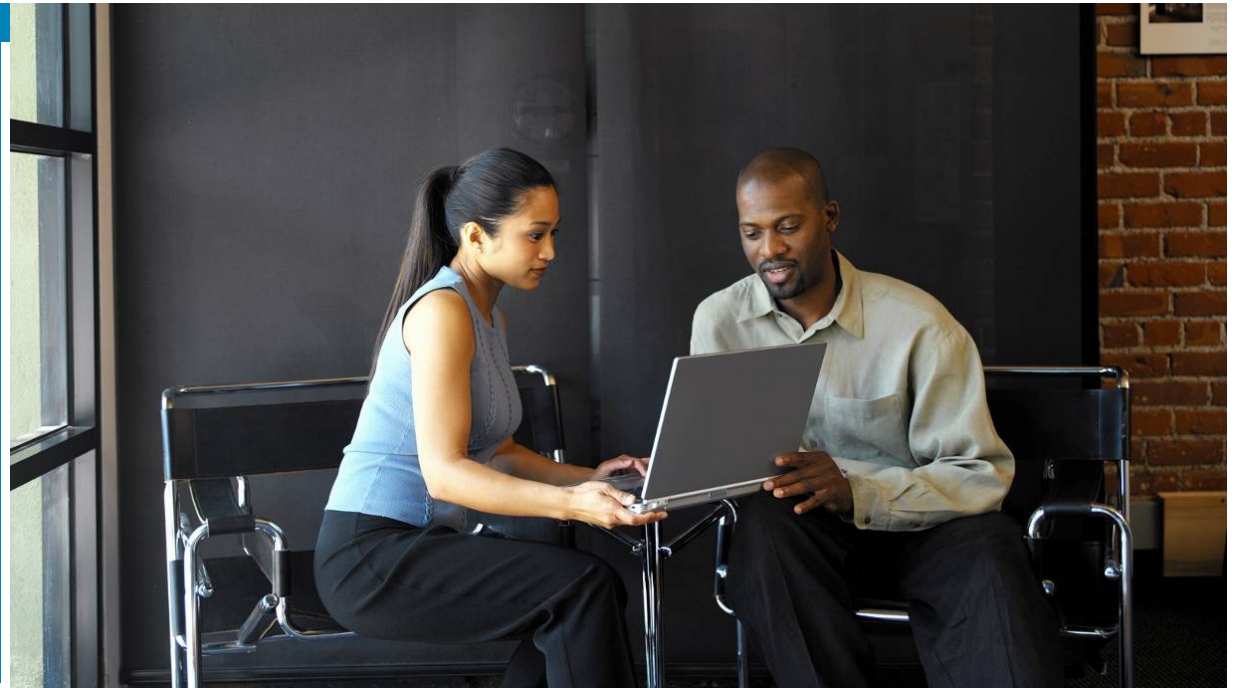
Corporate Consulting Engineering

DxE/Fellow meeting, April 24, 2008

Agenda

- **Definitions**
- **Trends**
- **My tea leaves**
- **What should Cisco do?**

Definitions



- **When talking about Internet and broadband issues, many people are confused just because some words have many meanings**
- **Broadband, Service, Internet, ISP, NGN, Operator, ...**
- **As a general suggestion, be careful with words when you talk with people**

Definitions

- **Internet access**

Given Internet access, one can communicate with other nodes that have Internet access

- **Broadband**

Access to an IP based network

- **Service**

An IP based service that can be accessed using an IP

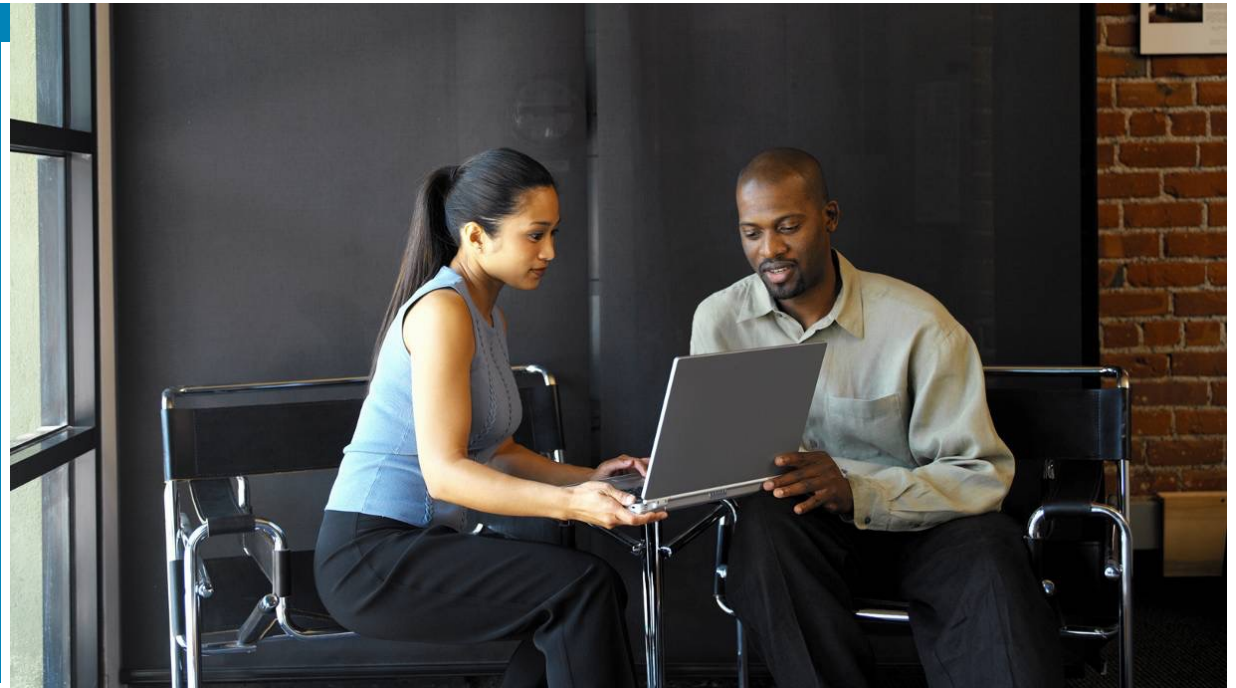
- **Access Provider (some are Internet Providers)**

Provider of broadband access

- **Internet Provider / ISP**

Provider of Internet access

Trends



- **30 years ago, we had one telco in each country...**
- **Main players are:**
 - End users**
 - Access providers / Tier2**
 - Tier1**
 - Providers of services**
 - Governments**

End user

- They want to access the services of their choice
- They access Internet from many locations
- In some cases they run the services themselves
- Some are very interested in only buying “everything” from one player, but many are not
- They are very sensitive to price, as price is the differentiating factor between access providers
- They are happy to pay for services, but not as much for the broadband access

Examples

- Vodaphone in Nov 2007 released ½ year figures:
 - Messaging and data is 20% of revenue
 - Voice revenue increased 7%
 - Messaging revenue increased 9%
 - Data revenue increased 49%

<http://www.arcchart.com/blueprint/show.asp?id=428>
- Swedish Government started project named “Electronic Services – Accessible whenever from wherever”

Access providers / ISP / Tier2

- Compete using **only** price as differentiating factor
- Try to cross subsidize network costs with income from Services
- Are not interested in competition regarding services
- Have no problems being responsible for the end users
- Try to find new customers (not steal customers from competitors)
- When interested in more bandwidth, they peer with other Tier2 instead of buying more from Tier1

Internet Providers - Tier1

- They charge Tier2 for transit
- They have no QoS in the peering with other Tier1
- They are scared of loosing traffic
- They do not really understand what is happening, and what their future role is, but they know they own fiber, and they know they have global presence

Providers of services

- They are end users just like their customers
- They want better quality on their Internet access
- When they do not get better quality, they go multihomed, in some cases massively multihomed (and bypass the Tier1)
- They are looking for CDN networks, but they cost 10 times as much as Internet Access
- They understand their competitor is the service run by the access provider, but not the other way around

Governments

- Competition is very important for governments
- So is “ability to innovate”
- Have regulation based on how the world looked 30 years ago (or at least 20)
- But they have started to ask questions
- Outside of the US, they think Internet is “a US thing”
- Many governments have been told Internet is broken, and that we need something new (Future Internet)

My tea leaves



- **If we place all of these trends and views in a pot and stir, what do I see...**
- **I am most worried about Tier2's, the access providers, the mobile providers**
- **They build very expensive networks when what their customer want is Internet Access**

End users

- They will require that the services they access are reachable from anywhere on the Internet
- They ignore the local services (if they are not good enough) but care about Internet Access
- They do not mind bundling of good services with their access, but the services have to be good
- They will run their own services
- They will start requiring better SLA, including how fast a broken connection is repaired
- I hope they are prepared on paying for this...

Access providers / ISP / Tier2

- Many overestimate the interest for their (local) services
- Many will fight hard to run local services not accessible from anywhere on the Internet
- The production cost for the IP packets will be higher than if they sold “just” Internet Access
- Mobile phone providers will become like any Access Provider, i.e. only Internet Access will be interesting for their customer, but they do not acknowledge that
- If they should run a service, they **must** understand that their competitors are global services

Internet Providers - Tier1

- The Tier1 start cooperation with CDN players
Level3 – Limelight, Who will collaborate with Akamai?
- They understand they need “better” IP packets
Who will be the first to request better peering
On the other hand, it is unclear what better peering is
- They will pay Tier2 for upgrade of the Tier2 network
- They will start selling special products to providers of services
Specifically online gaming and video distribution (live video)

Providers of services

- They will compete violently with each other
- The very large and the very specialized will survive
- As they have “control” of the end user, they will continue to be evaluated very high
- Their service must be accessible from anywhere
- Multihoming is the solution today, but if ISP come with better product, they will buy it
- They will look carefully at hosting alternatives
- P2P networks build their own overlay networks

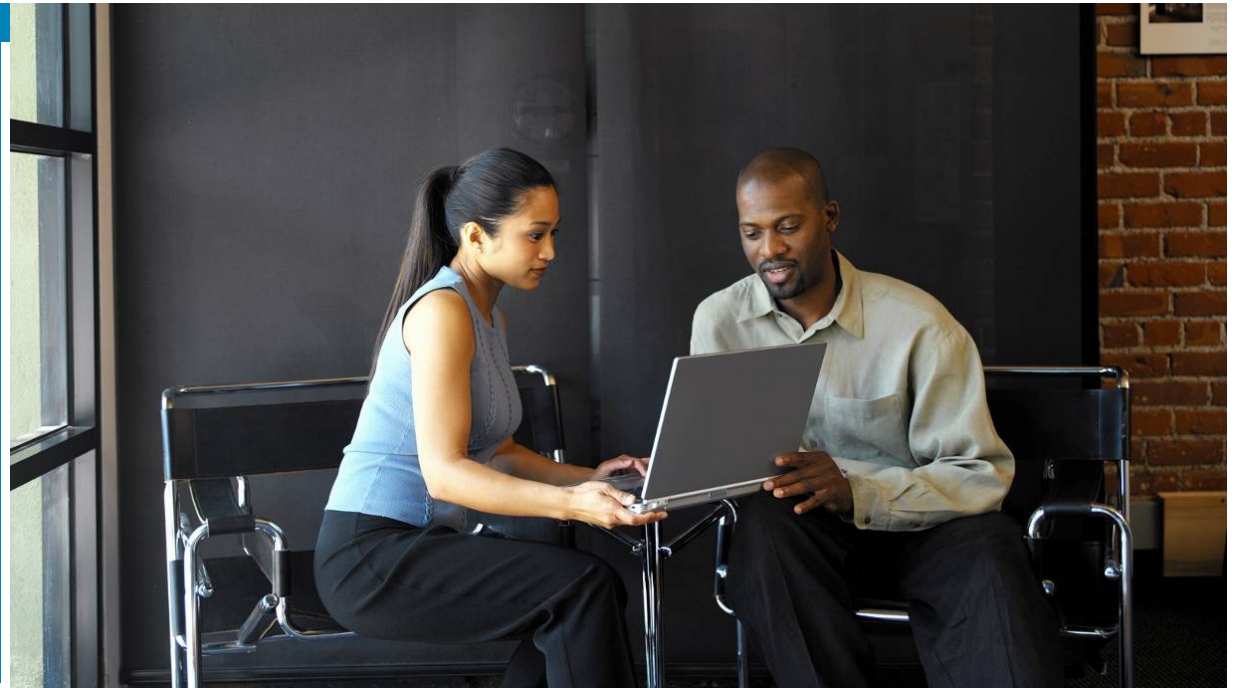
Governments

- They will enforce good competition between services
- They are already looking at things from the consumer perspective (*efficient choice*)
- They will look for roaming prices to go down
- They will continue to look for “who is responsible for ...”
- They will be confused for many years over implications of global reach of digital services
- They look at their own services, i.e. at themselves as providers of services
- Regulative tools are slow, and everyone know this

Where will this lead us?

- Only Internet Access will be interesting for end user
This include Mobile Telephony
- We will see more separation between different players
Access, Internet and Service Provider
Specifically separation between infrastructure / transmission,
Internet / IP and services
- Governments will enforce responsibilities, efficient competition and place for innovation
- Access providers and ISPs can not rely on any other source of income than them selling IP packets

Cisco



- **Some of the stories we at Cisco tell Access Providers and ISPs are only ok in the short run, as they clash with some of the views my tea leaves show**
- **Do we have products for players that only want to sell Internet access?**

What do I think Cisco can do better?

- Help access providers of all kinds produce cheap, stable, reliable Internet Access at a low production cost
 - What can they charge extra for?
- Help Enterprises and Private persons run their own services, so that they are in control of their domain name, their telephony, their jabber, their anything
 - Being in control does not have to be “run your own hardware”
- Help ISPs build the right products
 - Not concentrating in running services themselves
- Help service providers build interesting services
 - Data center technologies, virtual hosting, TV distribution

Specifically we should watch out for

- If we are designing too many things built upon a walled garden view of the world
- The governments that push for replacement for Internet
- The mobile operators, access providers and competitors that push for walled gardens
- Problems that make it very hard to build “Plain Internet Access”
- Competitors win all deals with ISPs because we do not have any products for the ISPs that only want to sell Internet Access

Positive things

- We know how IP works
- We push for open standards
- We are not afraid of competition from open source
- We have good control over the Enterprise market
- We know what ISPs wants
- We have good connections with regulators, and are trusted advisors to many organizations
- Networking Academies and Networkers are strong!

