

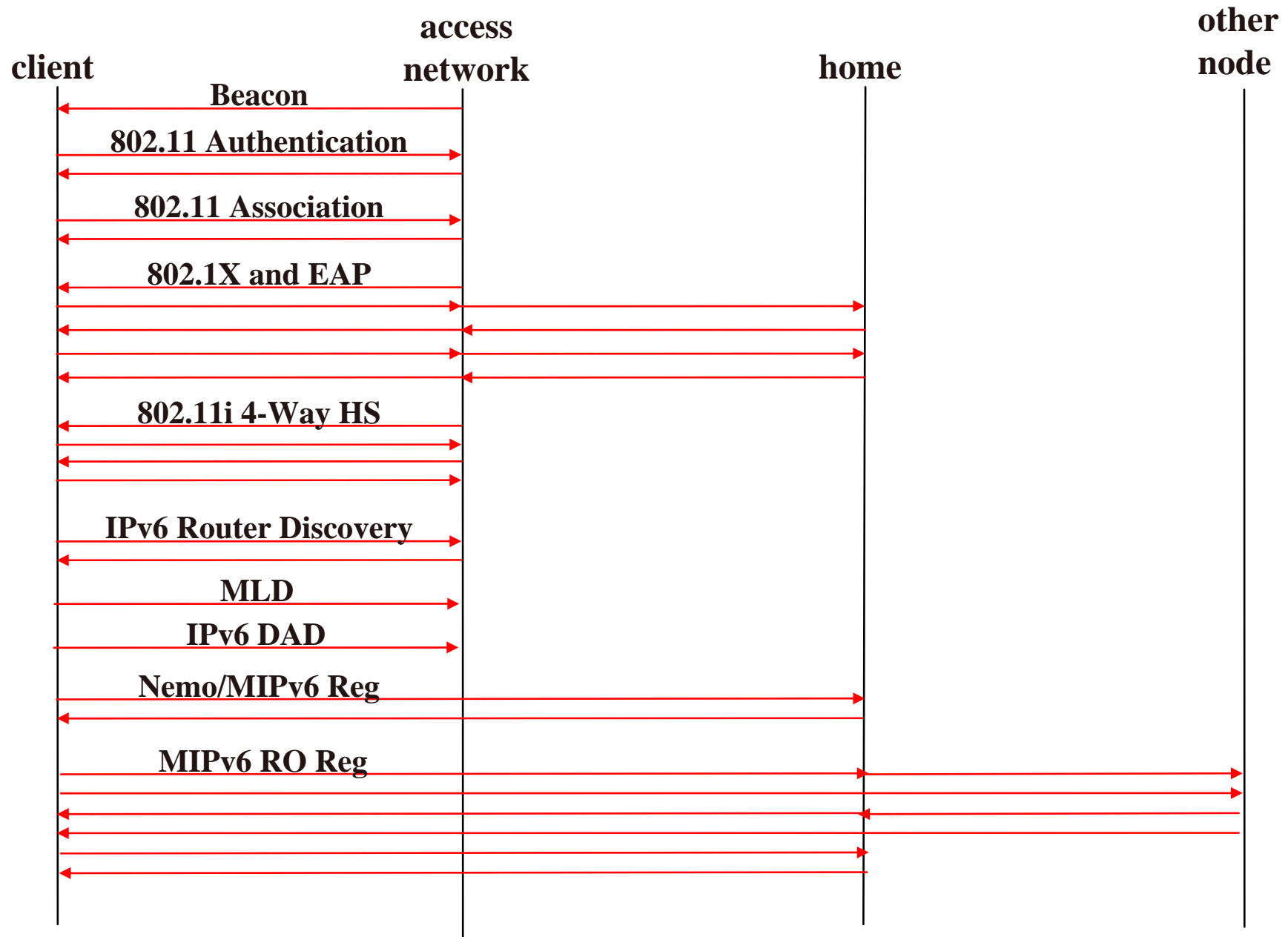
Challenges and Opportunities in the Internet Mobility Space

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Challenges

- Deployment – some, but not all that much
- Competing techniques – L2 vs. L3 vs. L7, multiple approaches on each layer
- Focus on mobility as a billable service
- Focus on optimizations
- Network access is not fully automated
- Not a lot of focus on deployment
- Scalability

Optimization – The Big Picture



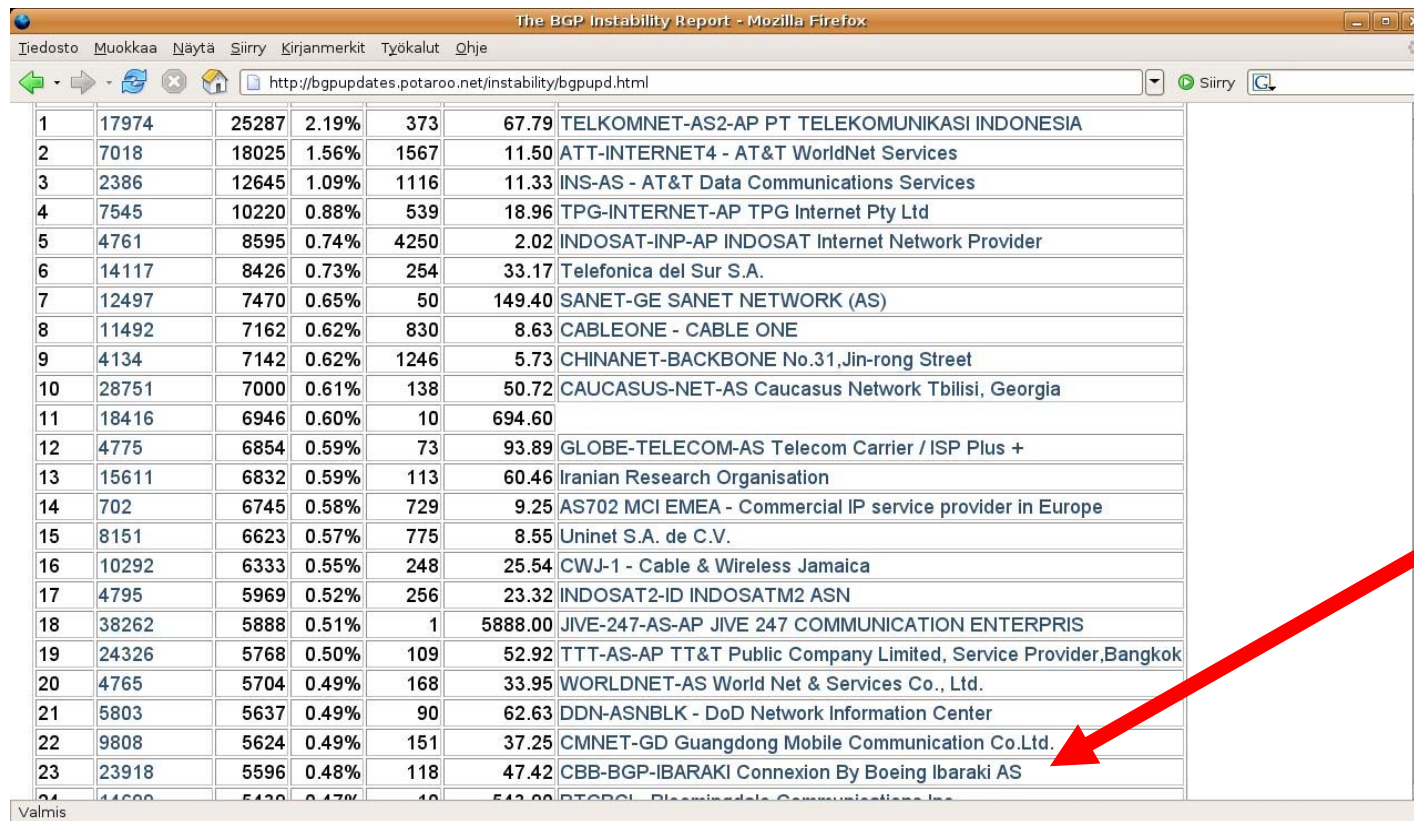
Network Access Automation

- Prerequisite for any mobility solution
- NOT universal today

The screenshot displays a mobile website interface for 'Fairmont NET'. The page is titled 'HIGH SPEED INTERNET ACCESS' and features a sidebar on the left with a 'Fairmont NET' logo, a date 'Thursday Nov 30, 2006', a weather section for 'TODAY'S WEATHER' (High 32°F, Low 32°F), and a 'LOCAL INFORMATION' section. The main content area is divided into three sections: 'WIRELESS ACCESS' priced at \$13.95, a section for 'Fairmont President's Club Members' with a login link, and a 'GROUP ACCESS' section with a link for pre-paid internet. Below these is a '1. YOUR CONTACT INFORMATION' section with a form containing input fields for First Name, Last Name, Address, City, State/Province, Country, Zip/Postal Code, and Phone Number.

Scalability

- Example: network mobility and global Internet routing table scalability



The screenshot shows a web browser window titled "The BGP Instability Report - Mozilla Firefox". The address bar displays "http://bgpupdates.potaroo.net/instability/bgpupd.html". The main content is a table with 24 rows of data. A red arrow points to the 23rd row.

| | | | | | | |
|----|-------|-------|-------|------|---------|---|
| 1 | 17974 | 25287 | 2.19% | 373 | 67.79 | TELKOMNET-AS2-AP PT TELEKOMUNIKASI INDONESIA |
| 2 | 7018 | 18025 | 1.56% | 1567 | 11.50 | ATT-INTERNET4 - AT&T WorldNet Services |
| 3 | 2386 | 12645 | 1.09% | 1116 | 11.33 | INS-AS - AT&T Data Communications Services |
| 4 | 7545 | 10220 | 0.88% | 539 | 18.96 | TPG-INTERNET-AP TPG Internet Pty Ltd |
| 5 | 4761 | 8595 | 0.74% | 4250 | 2.02 | INDOSAT-INP-AP INDOSAT Internet Network Provider |
| 6 | 14117 | 8426 | 0.73% | 254 | 33.17 | Telefonica del Sur S.A. |
| 7 | 12497 | 7470 | 0.65% | 50 | 149.40 | SANET-GE SANET NETWORK (AS) |
| 8 | 11492 | 7162 | 0.62% | 830 | 8.63 | CABLEONE - CABLE ONE |
| 9 | 4134 | 7142 | 0.62% | 1246 | 5.73 | CHINANET-BACKBONE No.31,Jin-rong Street |
| 10 | 28751 | 7000 | 0.61% | 138 | 50.72 | CAUCASUS-NET-AS Caucasus Network Tbilisi, Georgia |
| 11 | 18416 | 6946 | 0.60% | 10 | 694.60 | |
| 12 | 4775 | 6854 | 0.59% | 73 | 93.89 | GLOBE-TELECOM-AS Telecom Carrier / ISP Plus + |
| 13 | 15611 | 6832 | 0.59% | 113 | 60.46 | Iranian Research Organisation |
| 14 | 702 | 6745 | 0.58% | 729 | 9.25 | AS702 MCI EMEA - Commercial IP service provider in Europe |
| 15 | 8151 | 6623 | 0.57% | 775 | 8.55 | Uninet S.A. de C.V. |
| 16 | 10292 | 6333 | 0.55% | 248 | 25.54 | CWJ-1 - Cable & Wireless Jamaica |
| 17 | 4795 | 5969 | 0.52% | 256 | 23.32 | INDOSAT2-ID INDOSATM2 ASN |
| 18 | 38262 | 5888 | 0.51% | 1 | 5888.00 | JIVE-247-AS-AP JIVE 247 COMMUNICATION ENTERPRIS |
| 19 | 24326 | 5768 | 0.50% | 109 | 52.92 | TTT-AS-AP TT&T Public Company Limited, Service Provider,Bangkok |
| 20 | 4765 | 5704 | 0.49% | 168 | 33.95 | WORLDNET-AS World Net & Services Co., Ltd. |
| 21 | 5803 | 5637 | 0.49% | 90 | 62.63 | DDN-ASNBLK - DoD Network Information Center |
| 22 | 9808 | 5624 | 0.49% | 151 | 37.25 | CMNET-GD Guangdong Mobile Communication Co.Ltd. |
| 23 | 23918 | 5596 | 0.48% | 118 | 47.42 | CBB-BGP-IBARAKI Connexion By Boeing Ibaraki AS |
| 24 | 14600 | 5430 | 0.47% | 10 | 5430.00 | BTORCL - Bhamiradele Communications Inc |

Opportunities

- Simple, good enough designs for the general user
- Mobility mechanisms that do not require AAA, bootstrapping, or configuration
- Focus on the entire system
- Research on optimizing the stack as opposed to an individual slice
- Research on moving networks without tunnel latency AND no BGP scaling problems