Next Generation Wireless Technology

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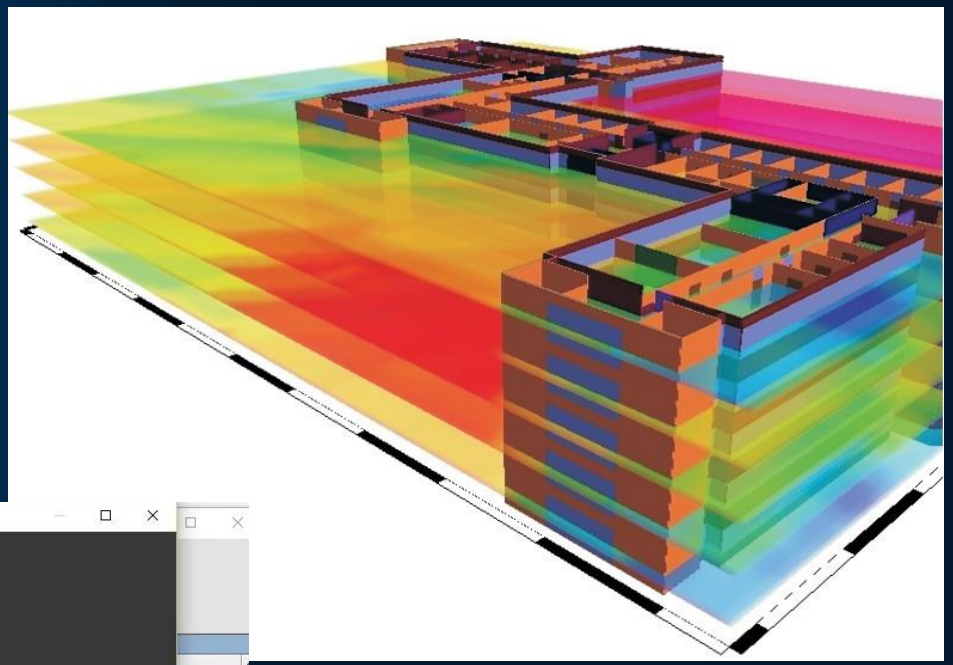
24th of November 2017 (2.30pm – 3.00pm)
BICSI South East Asia (SEA) 15th Conference
Avani Riverside Hotel - Bangkok, Thailand

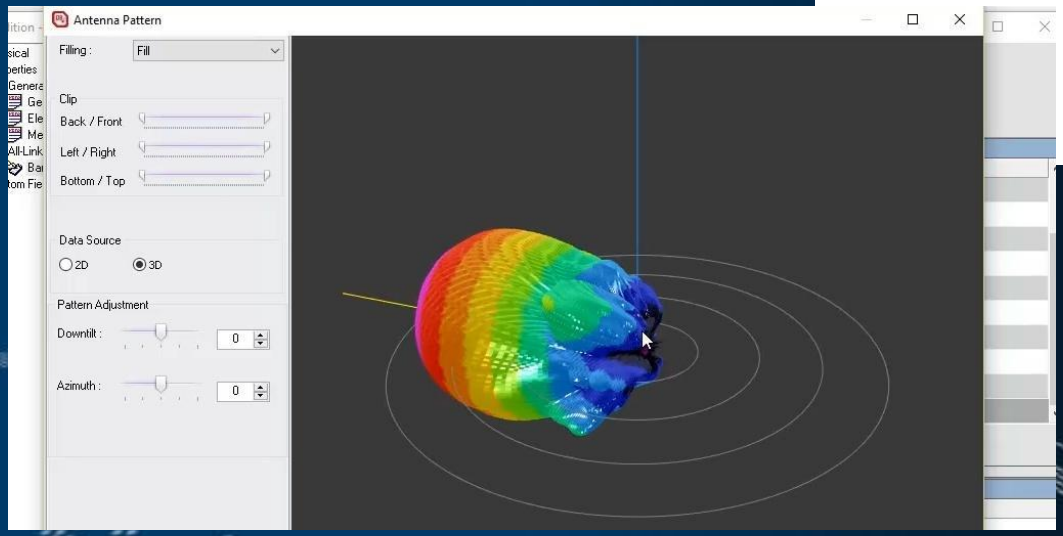
Agenda

- Wireless Design
- Wireless Validation
- Wireless Security
- New Wireless Technologies

Wi-Fi Design in buildings

- 3D wireless designs
- 3D Antenna Patterns
- Cable Path planning
- Project & BoM





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Dual 5 GHz radios

- 2x 5 GHz radios in 1x Access Point (AP)
- RF planning tools need to support it
- Smaller cells
- Proper channel planning

Residential Wireless

- Cabling per room (and APs where needed)

  e.g. Finland, Cat-6 cabling per room

- Wi-Fi Mesh Access Points

  e.g. Service Providers in Singapore

  Note: Wi-Fi repeaters degrade your Wi-Fi network performance

  IPTV streaming (see Globeron 1-2-3)

Site Survey Tools

- Site Survey Tool + External Site Survey Device

  (2.4 GHz / 5 GHz / Spectrum)




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KRACKS (published 16 Oct 2017)

- https://www.krackattacks.com/
- **K**ey **R**einstallation **A**tta**ck**s
- Breaking WPA2 by forcing nonce reuse
- *Discovered by Mathy Vanhoef (researcher at the University in Leuven, Belgium)*
- Solution both Clients and AP need to be patched

Wireless Security – WPA2-PSK

- Reminder - you can patch “KRACKS”, but
- If you know the password then still WPA2-PSK data frames can be decrypted (both TKIP and AES) and you authenticate/associate to the network.
- Globeron 1-2-3 series: http://www.youtube.com/wwwgloberoncom
- Obtain passwords:
  - Displayed on tables (e.g. Coffee shops)
  - Social Engineering (just ask for it)
  - Extract it from the Windows registry
  - Or file on the mobile phone
- PPSK (Person / Private / Per-user PSK)

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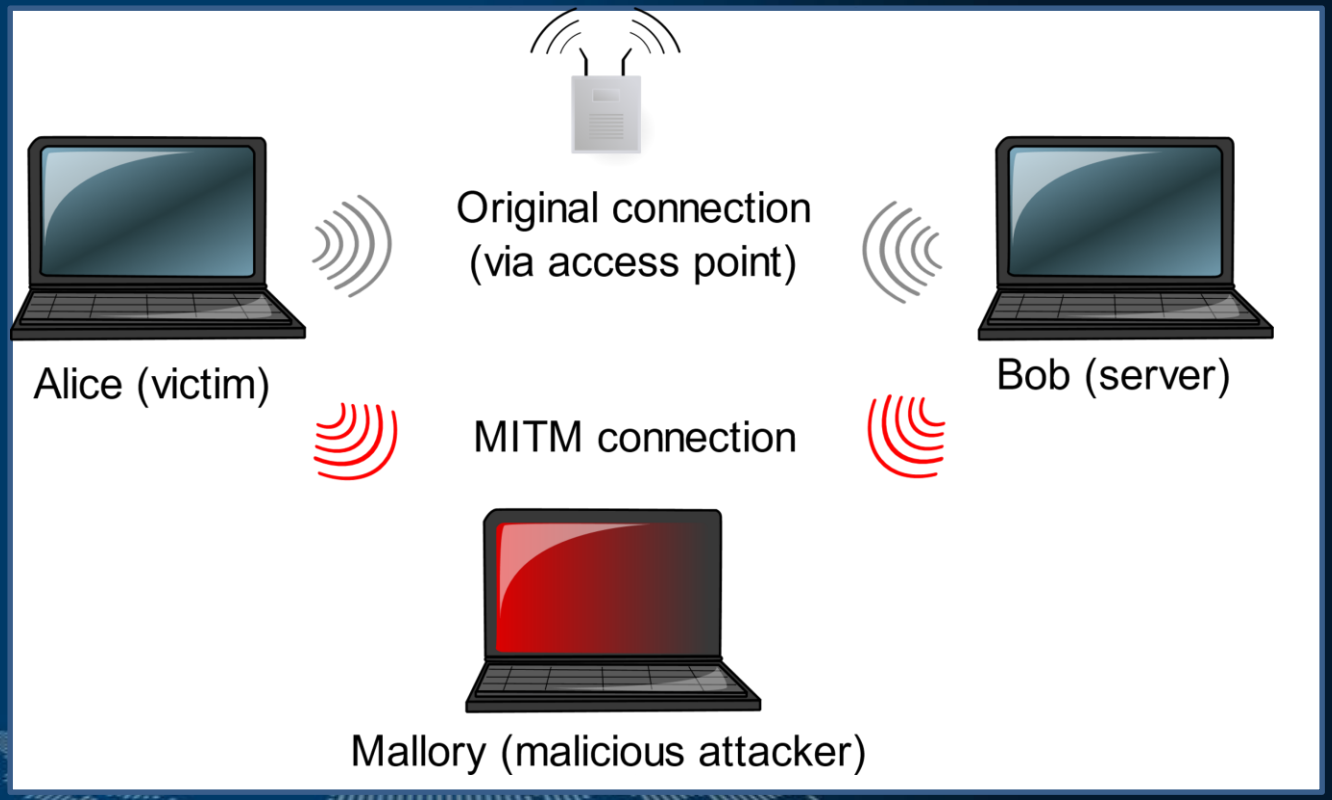
WPA2-Enterprise

- Man in the Middle (MITM) attack



Emerging Mobile/Cellular Standards

- 5G
- Spectrum Auctions can be challenging
- Small cells in building

Emerging Wi-Fi Standards

- **IEEE 802.11ad**
  - Aka “WiGig”
  - 60 GHz
- **IEEE 802.ai**
  - FILS Fast Initial Link Setup

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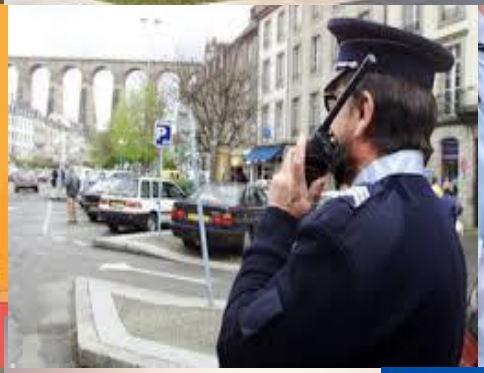
Emerging Wi-Fi Standards

- **IEEE 802.11ax**
  - MU-MIMO Downstream / Upstream
  - 2.4 GHz and 5 GHz and backwards compatible
  - Better power savings
  - Maybe 6 GHz spectrum
- **IEEE 802.11ay**
  - Improvement of IEEE 802.11ad
  - 60 GHz with speeds up to 20-40 Gbps
  - Backhaul or Mesh

Emerging Wi-Fi Standards

- **IEEE 802.11ah**
  - 900 MHz - longer range - 350 Mbps
  - IoT – Internet of Things
  - Aka “HaLow”
  - Better power savings
- **IEEE 802.11af**
  - UHF-VHF spectrum between 54 and 790 MHz
  - Super WiFi or White-Fi (TV White Spaces)
  - Requires a license

Wireless Experts - we want wireless services that work



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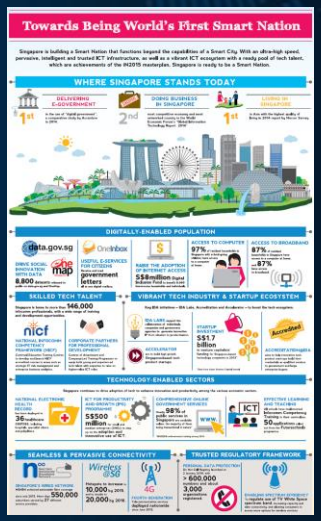
Smart Initiatives



- Smart Cities
- Smart Nations
- Smart Islands
- Smart Towns
- Smart Villages
- Smart Oceans

ITU-T's Key Performance Indicators (KPI's) for Smart Sustainable Cities (SSC)

- ICT (Information Communication Technology)
- Productivity
- Environmental Sustainability
- Physical Infrastructure
- Quality of Life
- Equity and Social Inclusion

Sources: ITU-T SSC KPI, Smart Nation SG http://www.smartnation.sg/

Emerging

- IoT – Internet of Things / IoE (Everything)
- SoT – Security of Things
- Smart Villages
  - Thailand, India, etc.
  - Reduce the digital divide
  - New business models
  - Local language

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Sustainable Development Goals (SDG) by United Nations

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