Sekilas tentang Grup Riset Mobile Communication and Security

Gambaran Singkat, Framework dan Roadmap Riset Grup Mobile Communication and Security

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Anggota Tetap dan Luar Biasa

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• Prima Kristalina
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• I Gede Puja Astawa

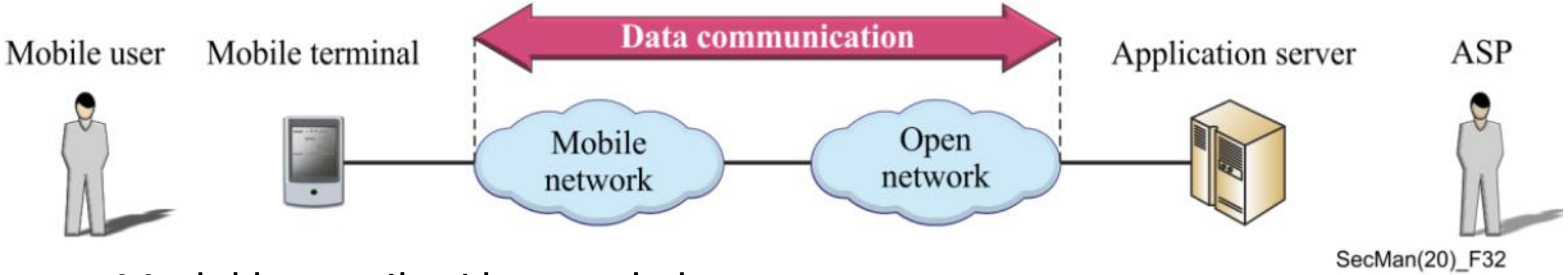
Gambaran Singkat

- Riset grup Mobile Communication and Security ini merupakan riset grup yang memiliki bidang/tema penelitian antara lain:
  - Sistem dan protokol komunikasi bergerak yang melibatkan perangkat bergerak yang umumnya memiliki resource terbatas, misalnya: smartphone, microcontroller (MCU), single boarded computer (SBC), maupun embedded system lainnya.
  - Sistem dan protokol komunikasi yang mungkin memanfaatkan protokol komunikasi yang sudah ada baik peer-to-peer maupun client-server, dan juga disain protokol komunikasi baru (generic). Sistem komunikasi bergerak yang melibatkan end-to-end data communications.
  - Disain protokol komunikasi generic berupa middle-ware software yang menghubungkan kernel-space dan user-space.
  - Disain protokol komunikasi dengan mempertimbangkan fitur-fitur real-time communication, efisiensi, robustness, reliable, dan security.
  - Implementasi protokol komunikasi bergerak meliputi komunikasi yang bersifat baik connectionless (message-oriented), connection-oriented, maupun hybrid (menggabungkan komunikasi message-oriented dan connection-oriented) dengan penerapan di teknologi jaringan wireless, mobile ad-hoc (MANET), vehicular ad-hoc (VANET), WSN, IoT, IIoT, Near Field Communication, dan Cellular Network.
  - Pengembangan protokol komunikasi dan aplikasinya meliputi communication protocol itu sendiri, routing, security dan privacy serta implementasinya baik web-based maupun mobile-based applications.
  - Pengembangan secure and privacy protection baik pada layer fisik (physical layer), data link layer, network dan transport layer, maupun application layer.
- Riset grup ini mendukung pusat riset yang mengembangkan 5 bidang unggulan teknologi dan inovasi: ICT, Metaverse, Robotics, Energy, maupun Smart Transportation.

ITU-T Technical Report, XSTR-SEC-MANUAL, "Security in telecommunications and information technology (7th edition): An overview of issues and the deployment of existing ITU-T Recommendations for secure telecommunications", September 2020.

Framework

- Model komunikasi bergerak secara umum



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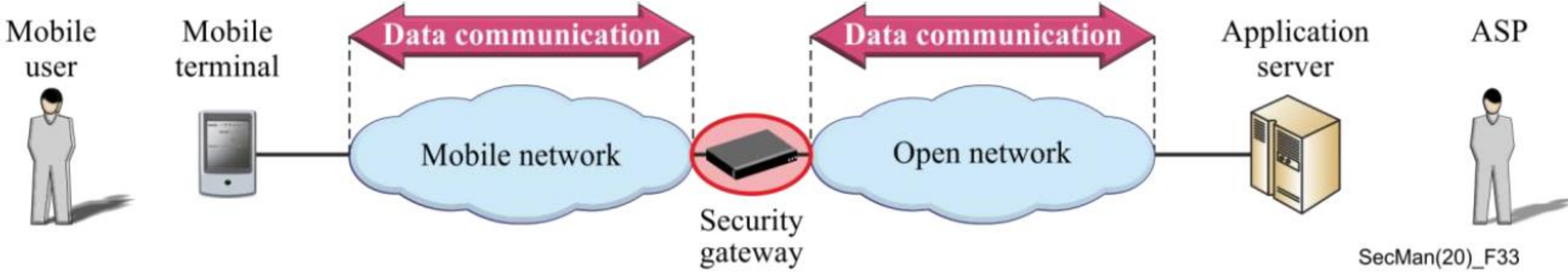
- Model komunikasi bergerak dengan gateway



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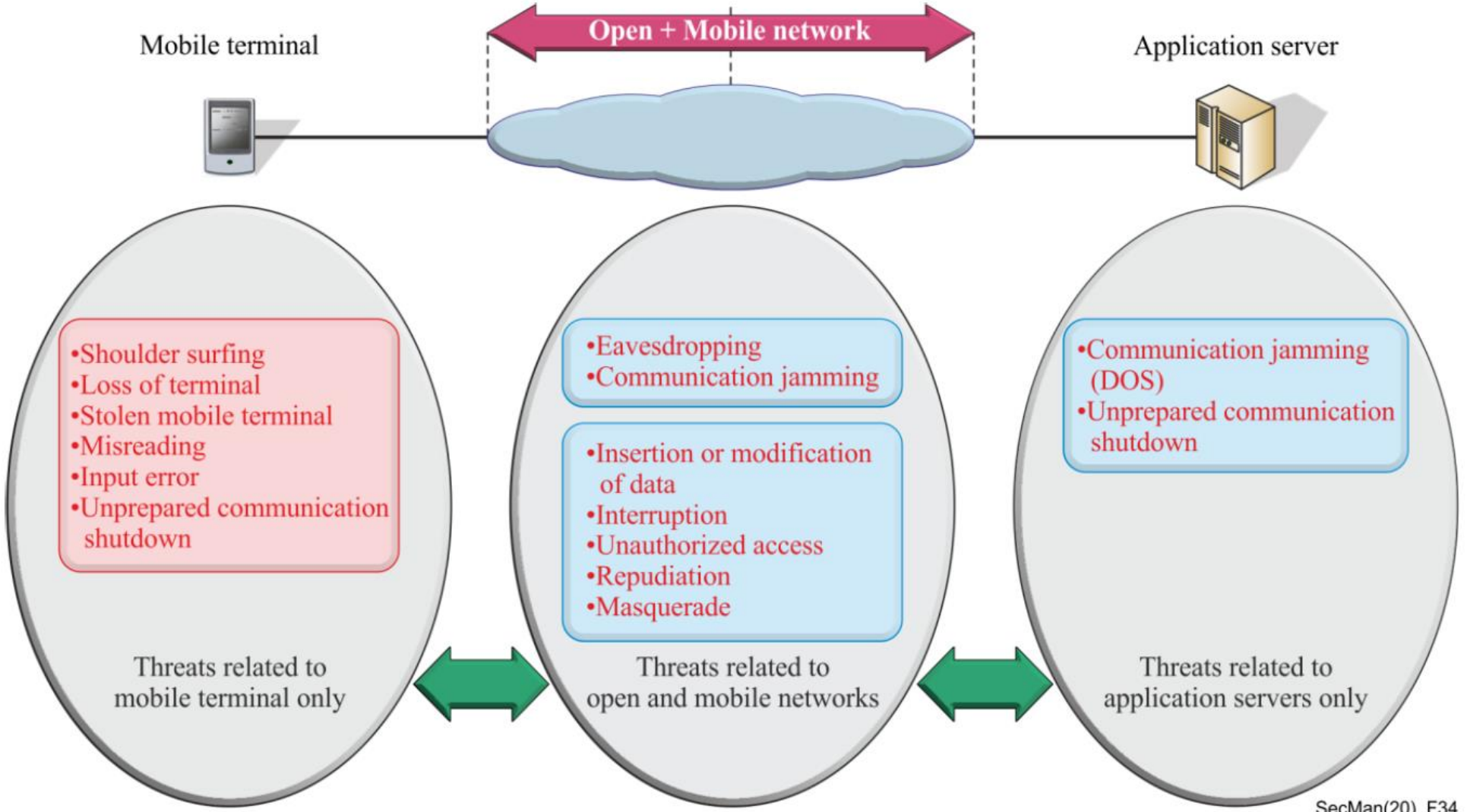
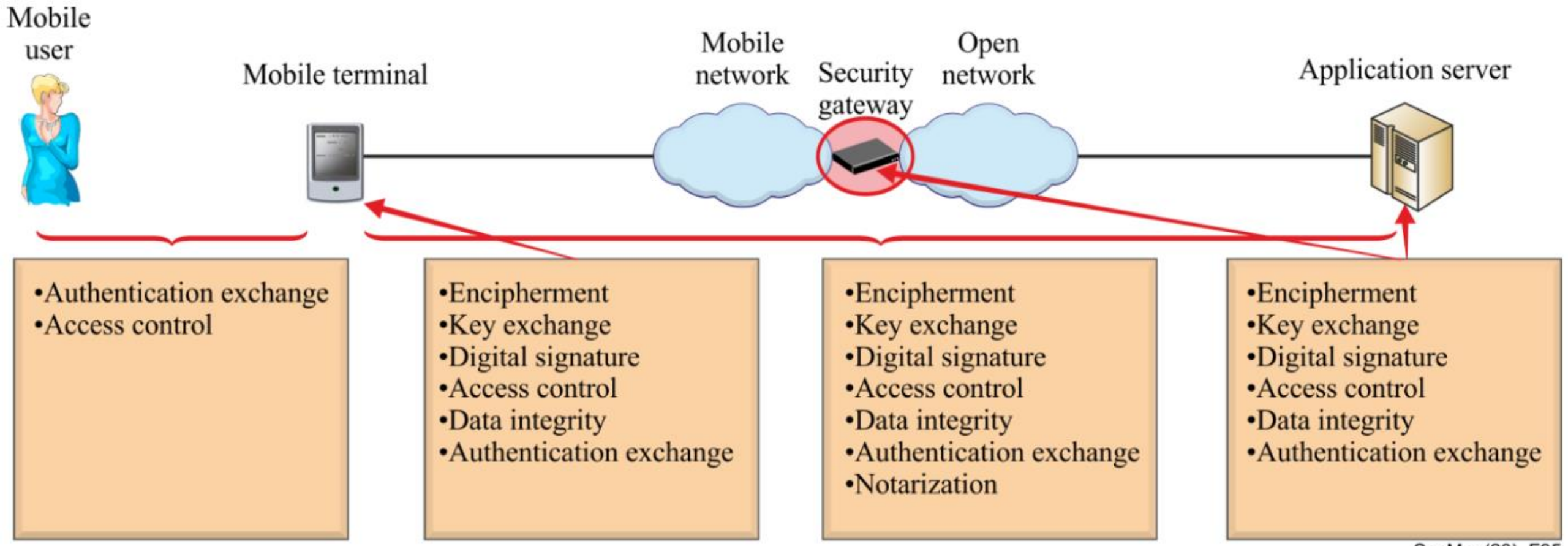
Framework: Threat yang Mungkin Terjadi pada Mobile Communications



Framework: Fungsi Security yang Dibutuhkan pada Mobile Communications



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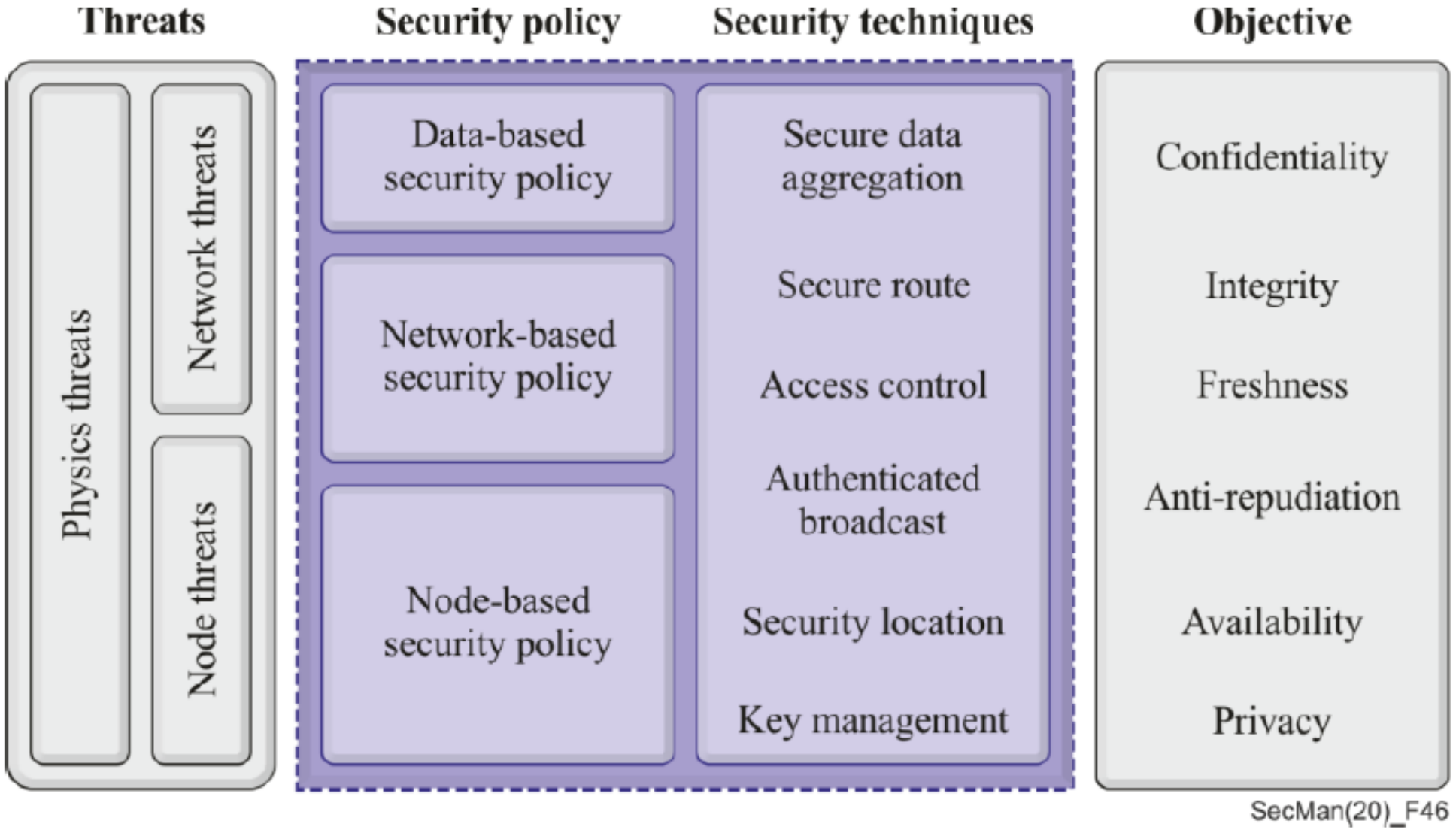
Framework: Security Model



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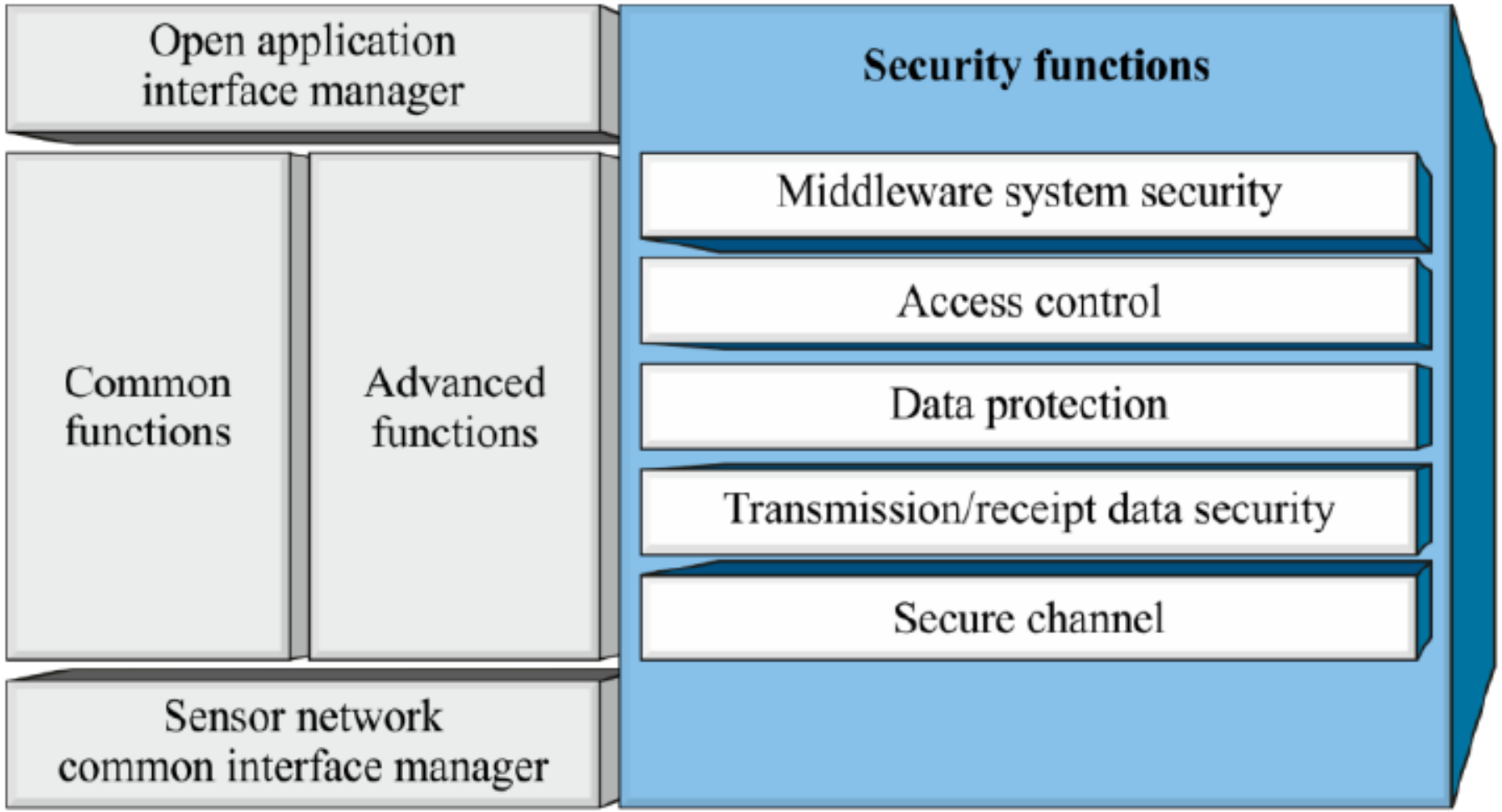
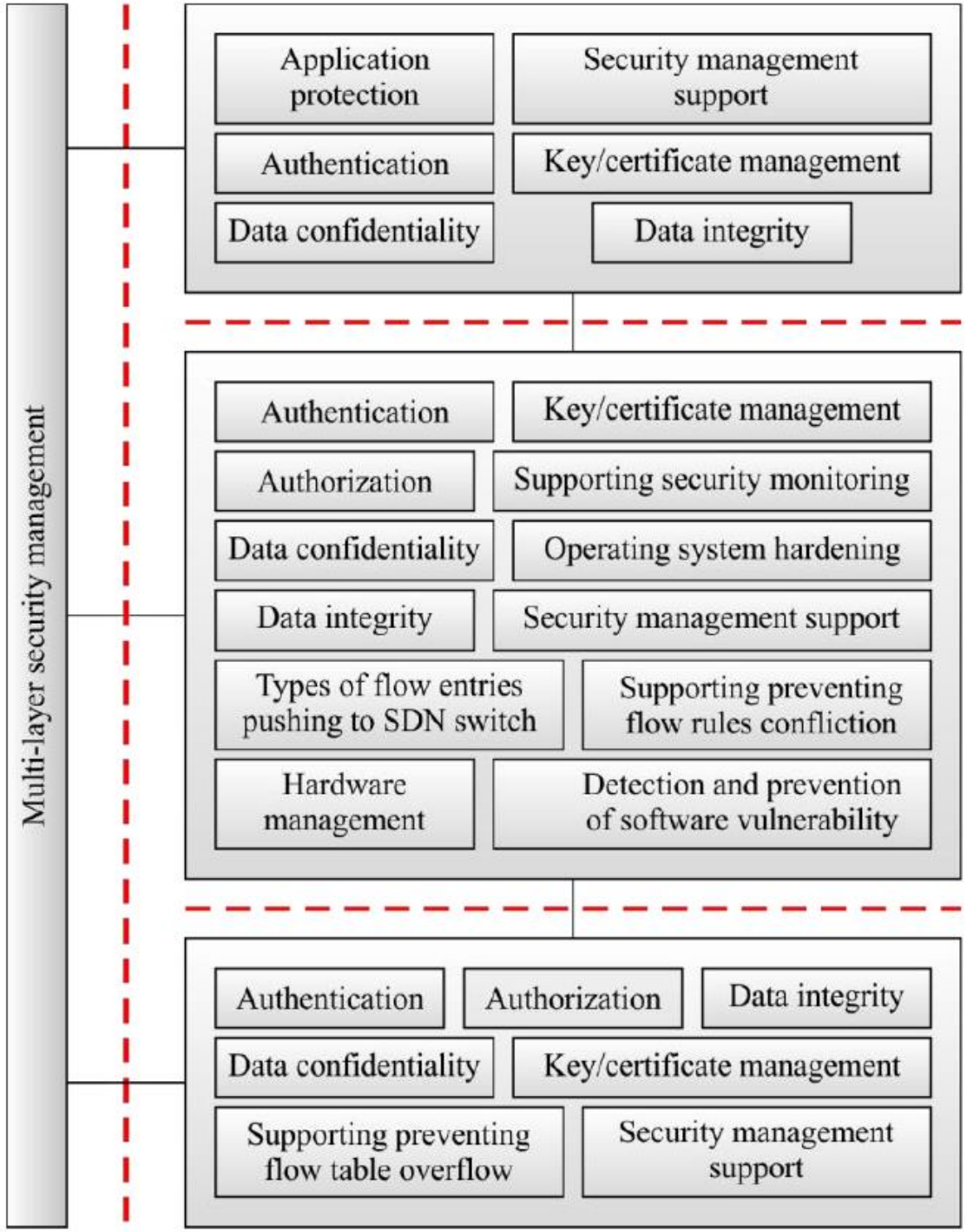
Framework: Middle-ware Security Model



Framework: Security Architecture for Mobile Communications



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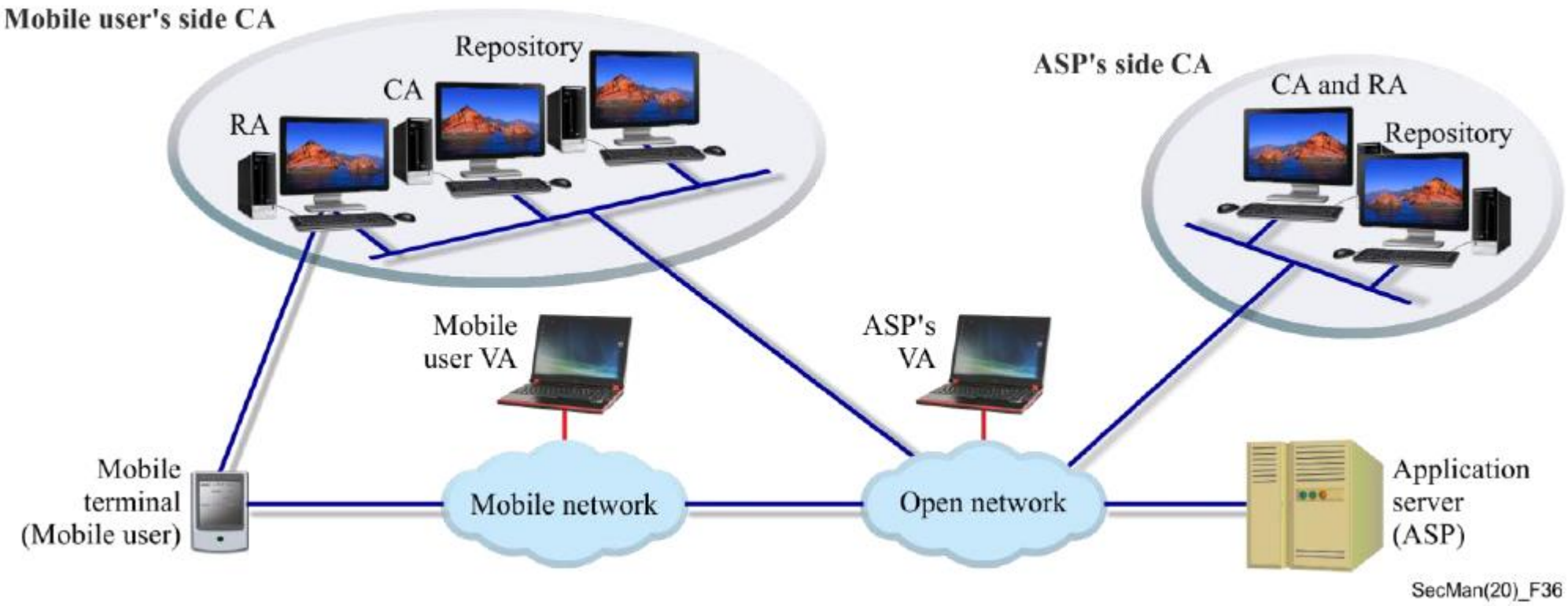
Framework: Public Key Model in Mobile Communication



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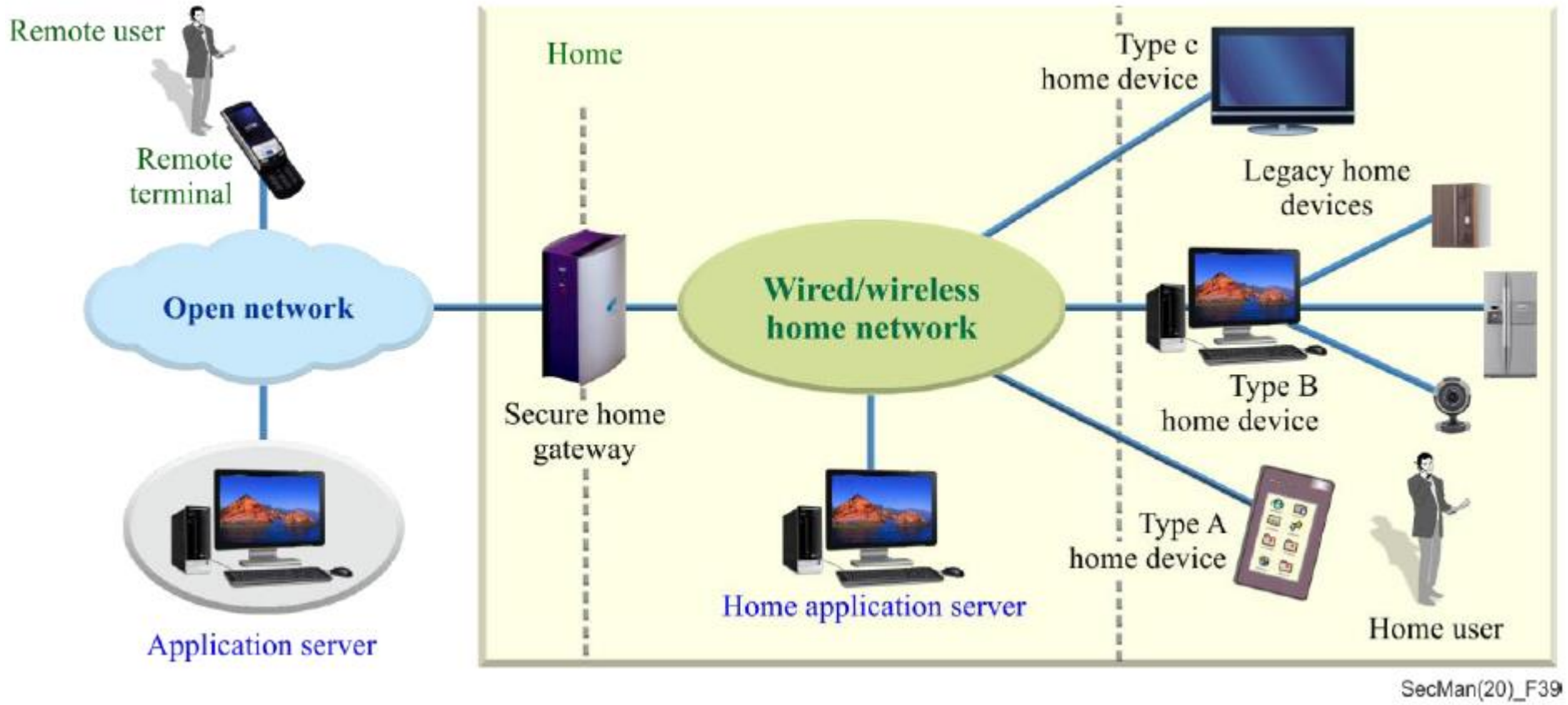
Framework: Home Network Model Security on Wireless Network



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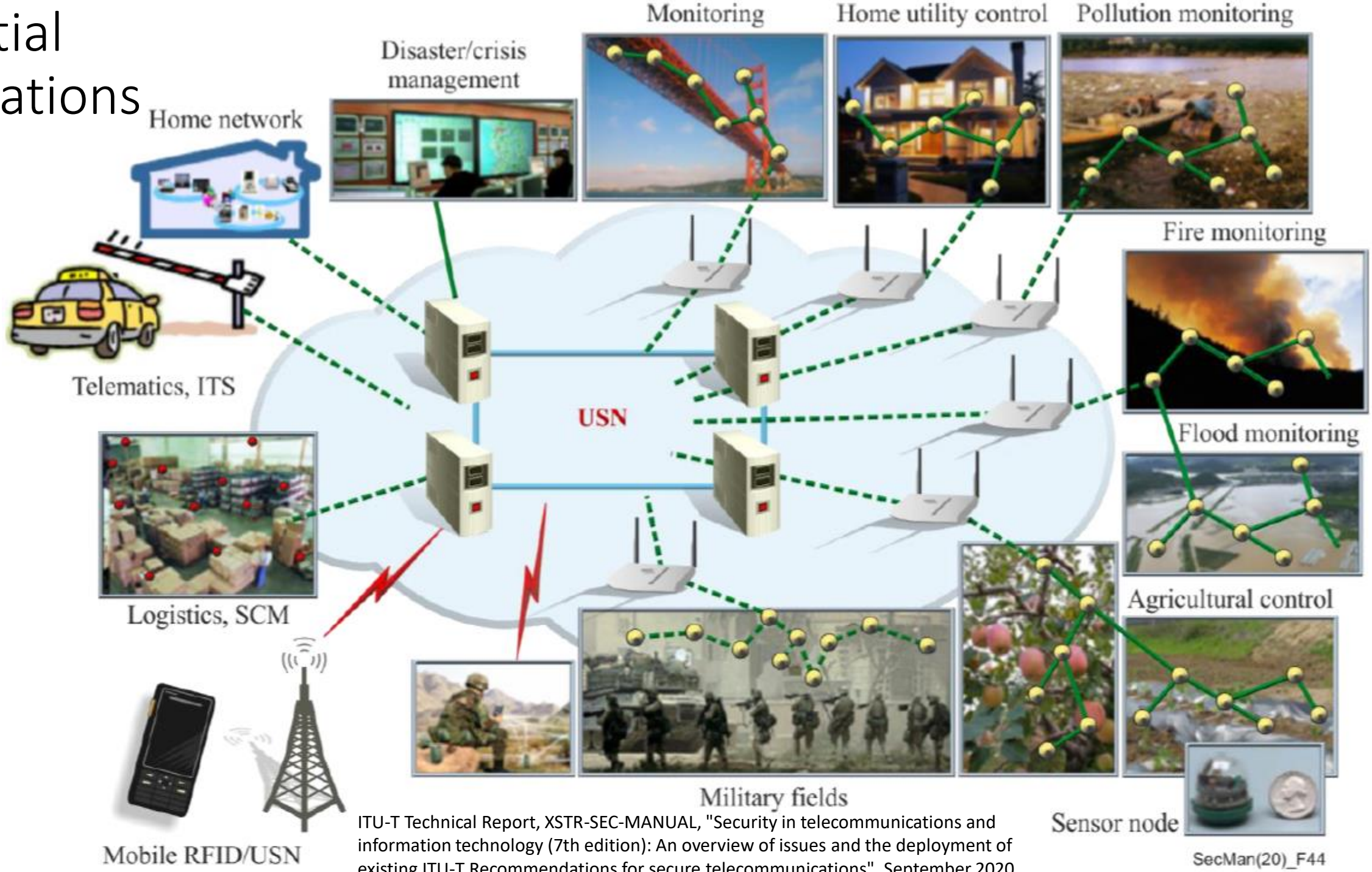
Potential Applications



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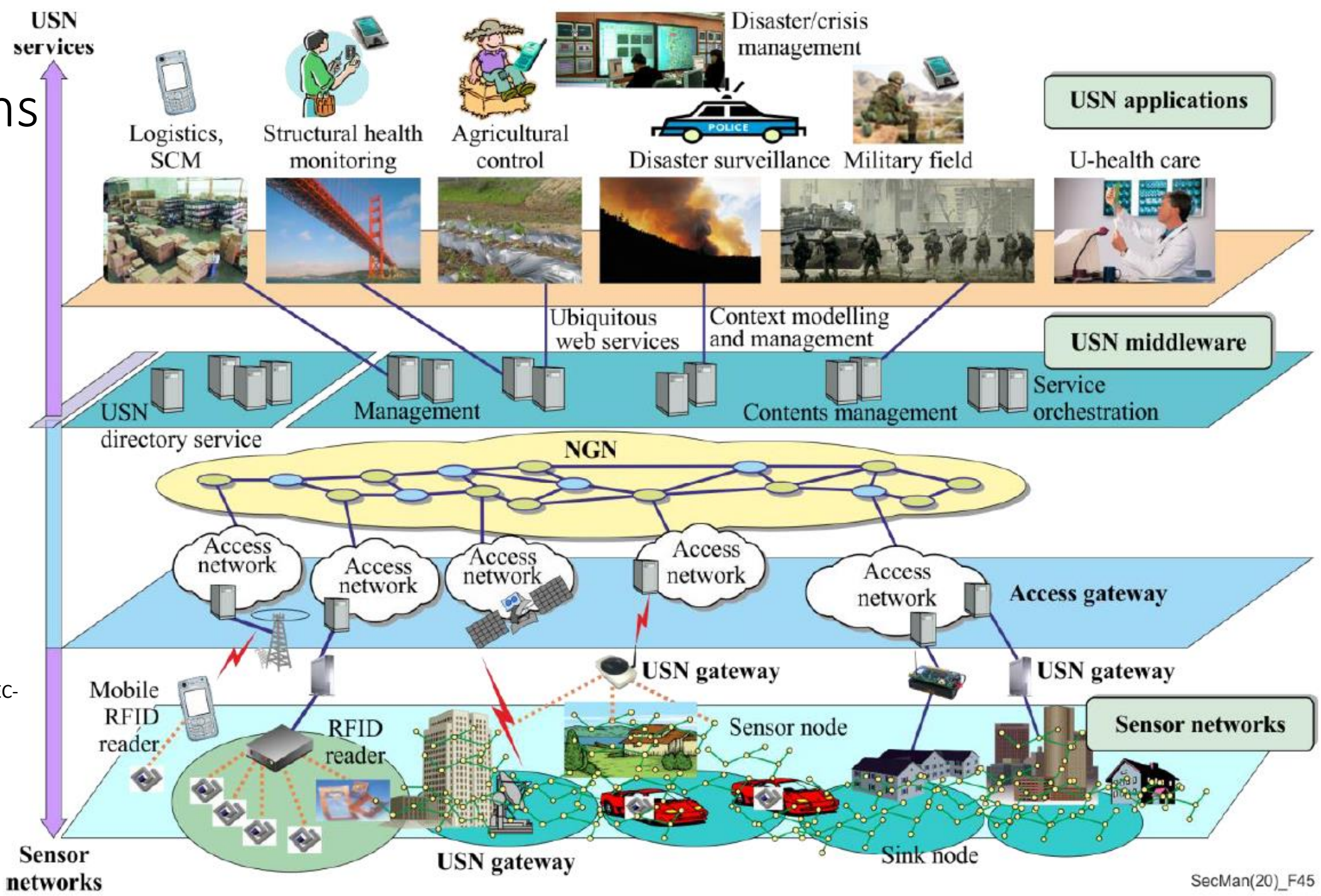

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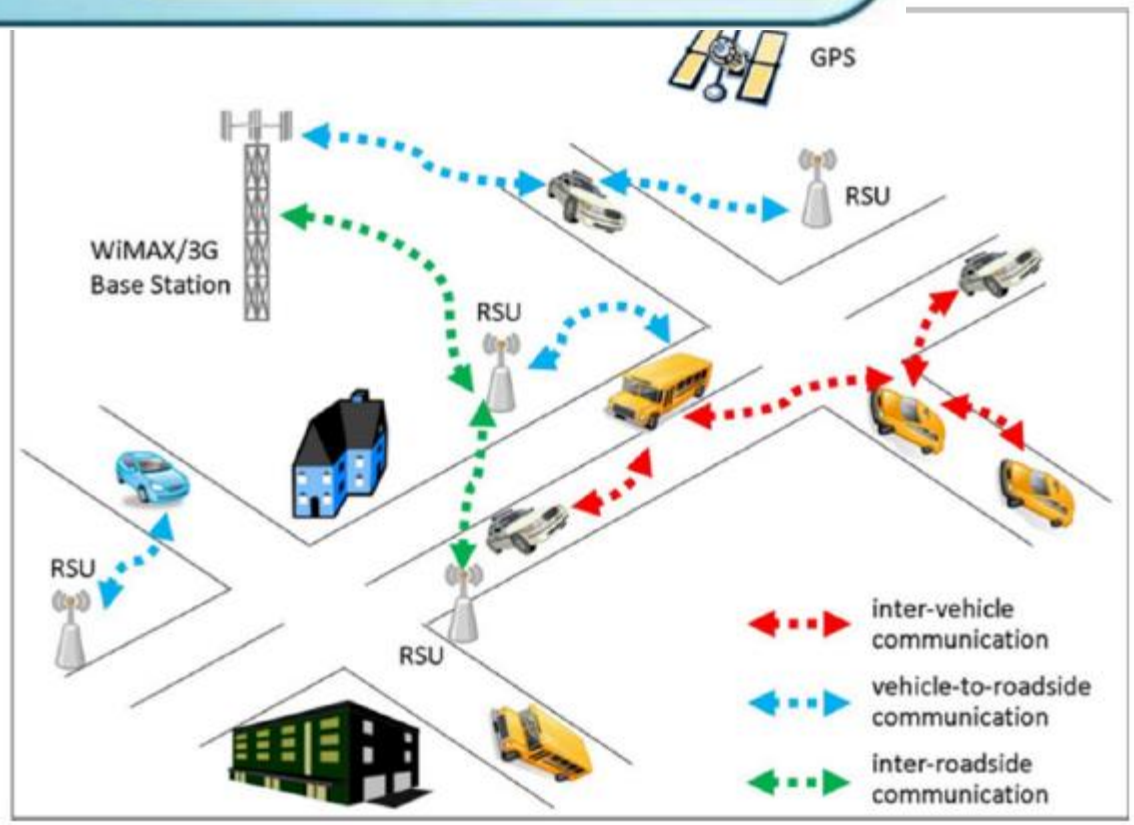
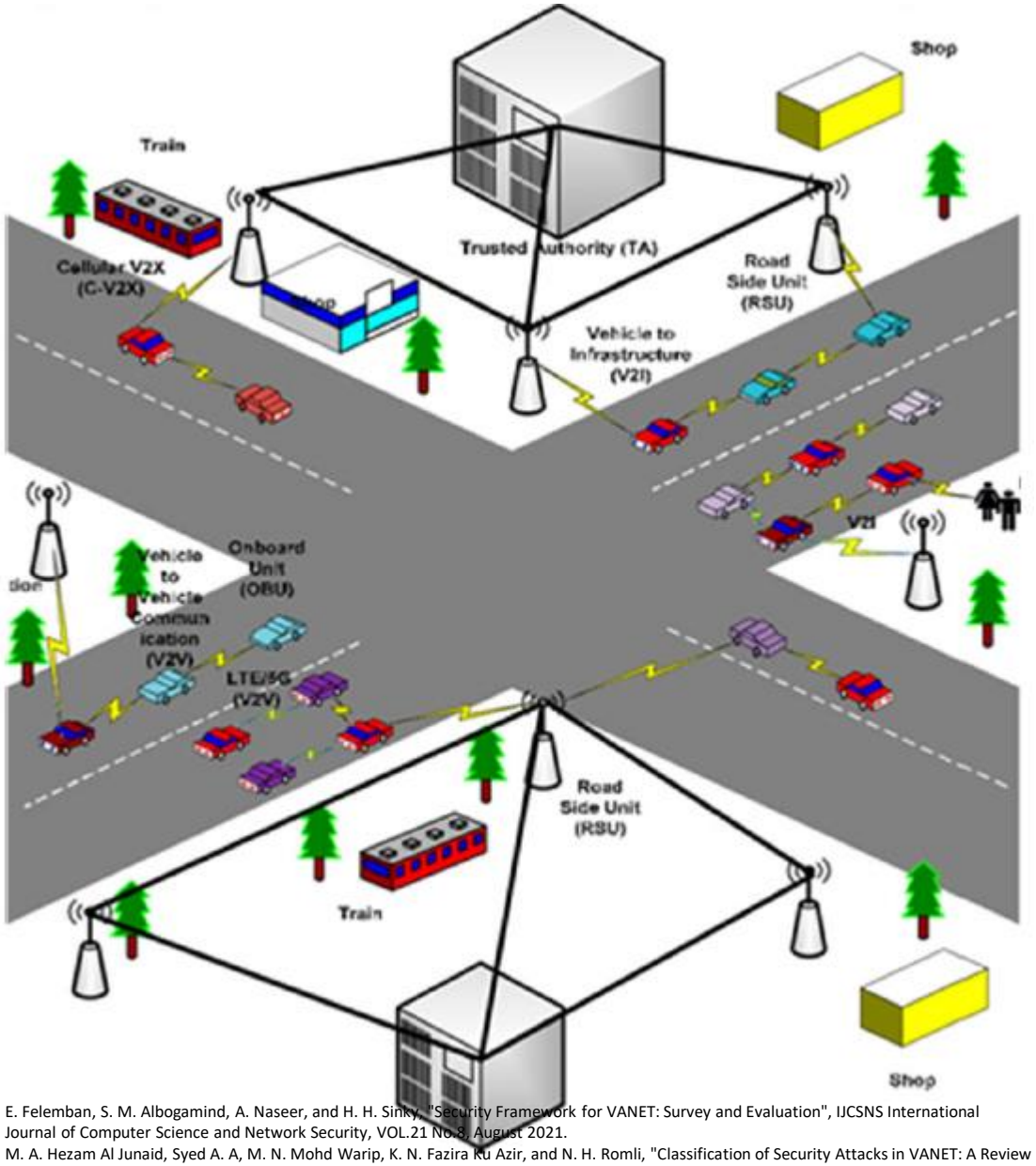
Potential Applications for MANETs, VANETs, FANETs





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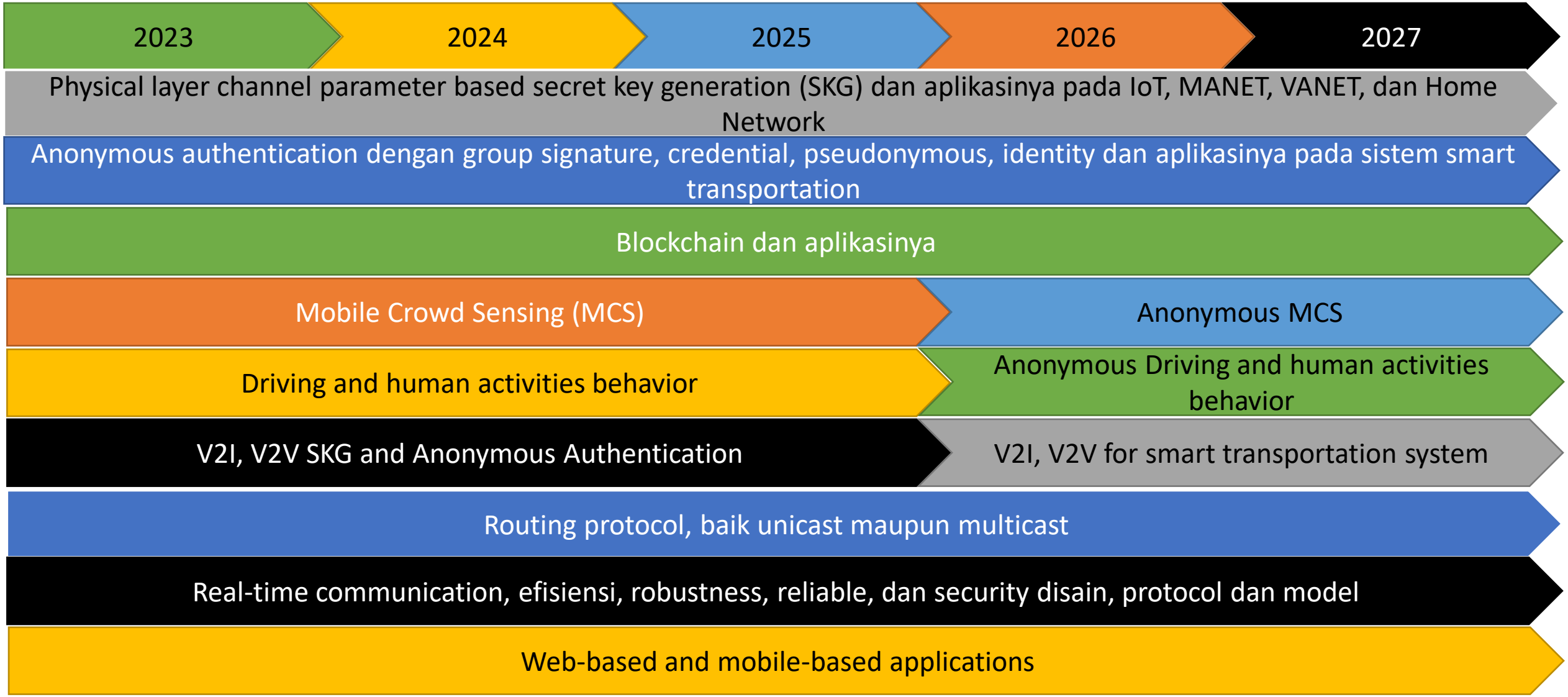
M. A. Hezam Al Junaid, Syed A. A, M. N. Mohd Warip, K. N. Fazira Ku Azir, and N. H. Romli, "Classification of Security Attacks in VANET: A Review of Requirements and Perspectives", MATEC Web of Conferences 150, 06038, 2018.
I. A. Sumra, P. Sellappan, A. Abdullah, and A. Ali, "Security issues and Challenges in MANET-VANET-FANET: A Survey", EAI Endorsed Transactions on Energy Web and Information Technologies, 2018.

Framework RG Mobile Comm & Security

Space		Security Requirements	Layer	
User-space	User, ASP	• Authentication exchange • Access control	User, ASP	Application
Middle-ware	User, Gate way	• Encipherment • Key exchange • Digital signature • Access control • Data integrity • Authentication exchange • Notarization	Gate way	Network Transport
Kernel-space	User, Gate way	• Encipherment • Key exchange • Digital signature • Access control • Data integrity • Authentication exchange	User, ASP, Gate way	Physical (PHY) Data Link

Catatan:
ASP = Application Service Provider

Roadmap Penelitian RG Mobile Comm & Security



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