Cyan Technology Ltd

Delivering Smart Metering Benefits to the Indian Utilities

Dr. Sean Cochrane
Strategic Marketing Manager, Cyan Technology

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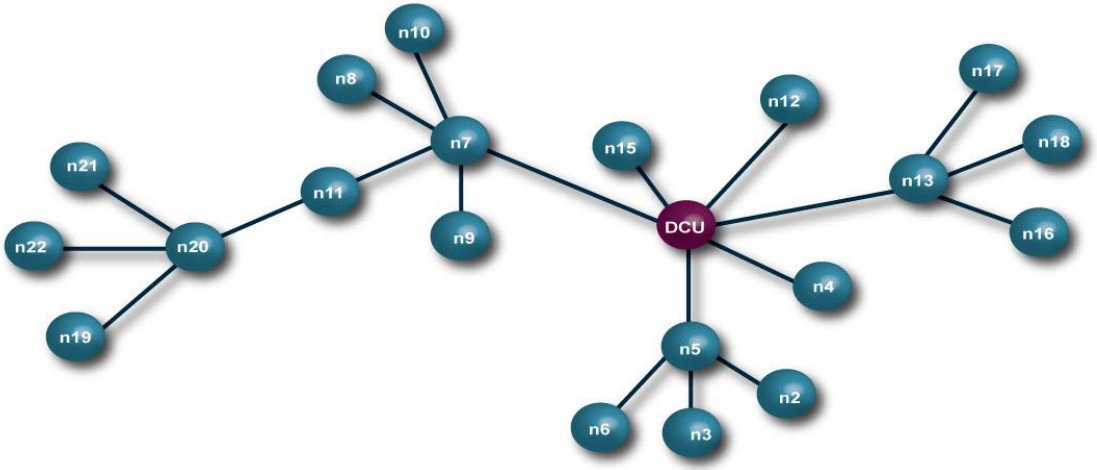
Cyan introduction – key points

- Cyan was established in 2002, was listed on the LSE (AIM) in 2005, and has focussed on “system products” since 2008
- Cyan provides smart energy solutions for the utility metering and lighting markets
- Cyan’s USP is an end-to-end platform – from meters and lamps to the enterprise data management system



Cyan introduction – business focus

- India
  - Partnerships with most of the top 10 Indian meter suppliers
  - Strong relationships with system integrators, network carriers, and government
  - Running smart metering pilots under local conditions

- China
  - Street and tunnel lighting deployments in several cities and provinces
  - Designed into largest lighting equipment manufacturer
  - Complete energy monitoring and lamp management/control

AMI requirements – local (Indian) considerations

- Low cost, high volume
  - Average consumer electricity bill: RS500 (US$10) per month
  - Typical selling price of a 1 phase meter: RS1500 ($30)
  - Single Indian states have more than 20 million consumers
- Tough, chaotic conditions
  - Demand regularly exceeds supply (frequent outages)
  - Supplies vary from 180V to 300V
  - Widespread tampering (35KV)

Typical New Delhi street scene

AMI requirements – information and control

- Automated meter readings
  - Online meter reading (billing data)
  - Legacy support for handheld
- Loss reduction and load management
  - Tamper detection – 30% losses in India
  - Online load surveys and tariffs
  - Scheduled and batch disconnects

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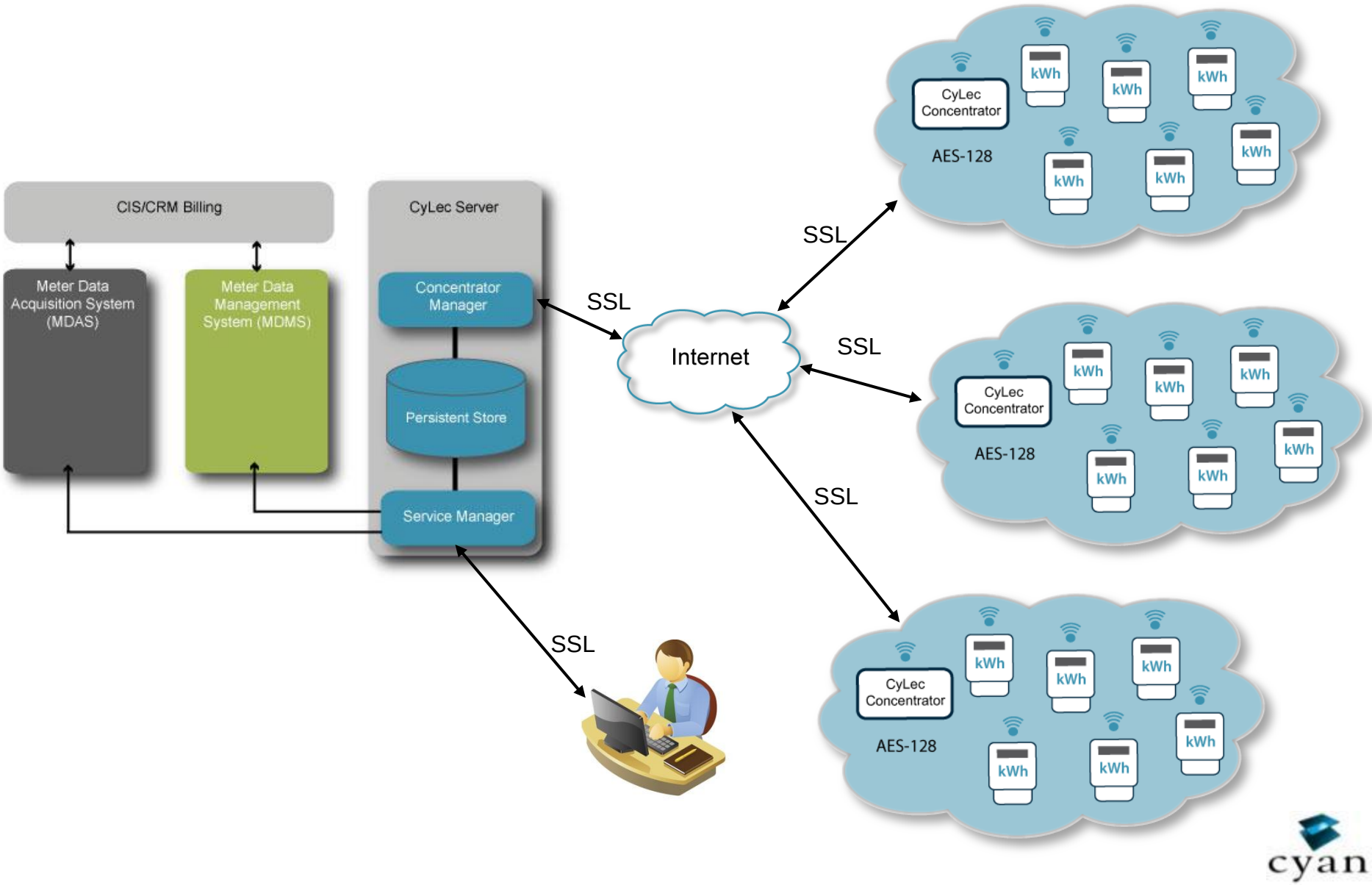
AMI requirements – communication system

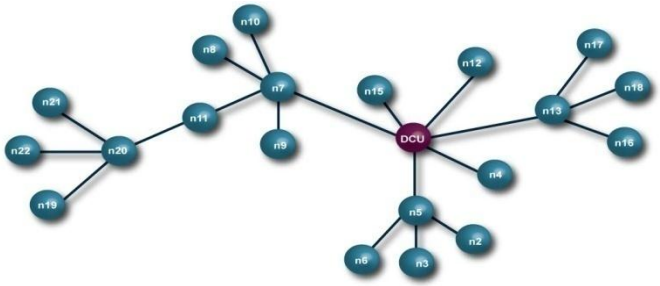
- Meter considerations
  - Easy upgrade path for existing meter hardware and firmware
  - Bi-directional communication - control, configuration, and reporting
  - Interoperability between multiple meter types and suppliers
- Network and infrastructure
  - Simultaneous point-to-point (handheld) and mesh (DCU) operation
  - Frequency with good range and penetration for neighbourhood area
  - Flexible connection to multiple Meter Data Management Systems
  - Low cost mesh concentrators with GPRS back haul

CyLec® platform - architecture



CyLec® platform – underlying radio mesh

- CyNet™ highlights
  - Robust low power meshing software for sub 1GHz radio
  - Flexible routing: AODV*, DPR*, self- forming/healing, easy deployment
  - Optimises data throughput: on demand route freezing
  - Dynamic CCA: automatically adjusts to changing RF conditions
  - Many man years of development (expert team in Cambridge, UK)
  - Designed for target applications – not by committee



* Adaptive on demand vector, Data packet routing, clear channel assessment

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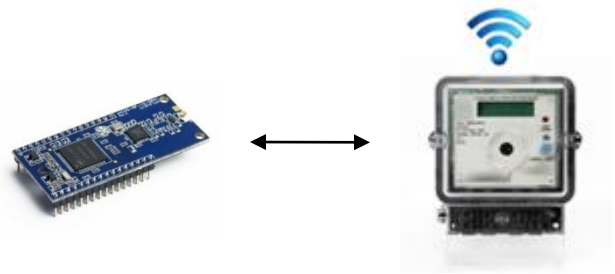
CyLec® platform – radio module

- Highlights
  - Connects to any meter via “4+1” wire UART interface
  - Transparent channel between meter and concentrator
  - Interoperable with any meter protocol/firmware
  - Firmware upgradable ‘over the air’
  - 915/868/865/470MHz options for worldwide deployment
  - >100m indoor range through barriers, >1Km in open field
  - Simultaneous handheld (legacy) and concentrator operation



CyLec® platform – concentrator

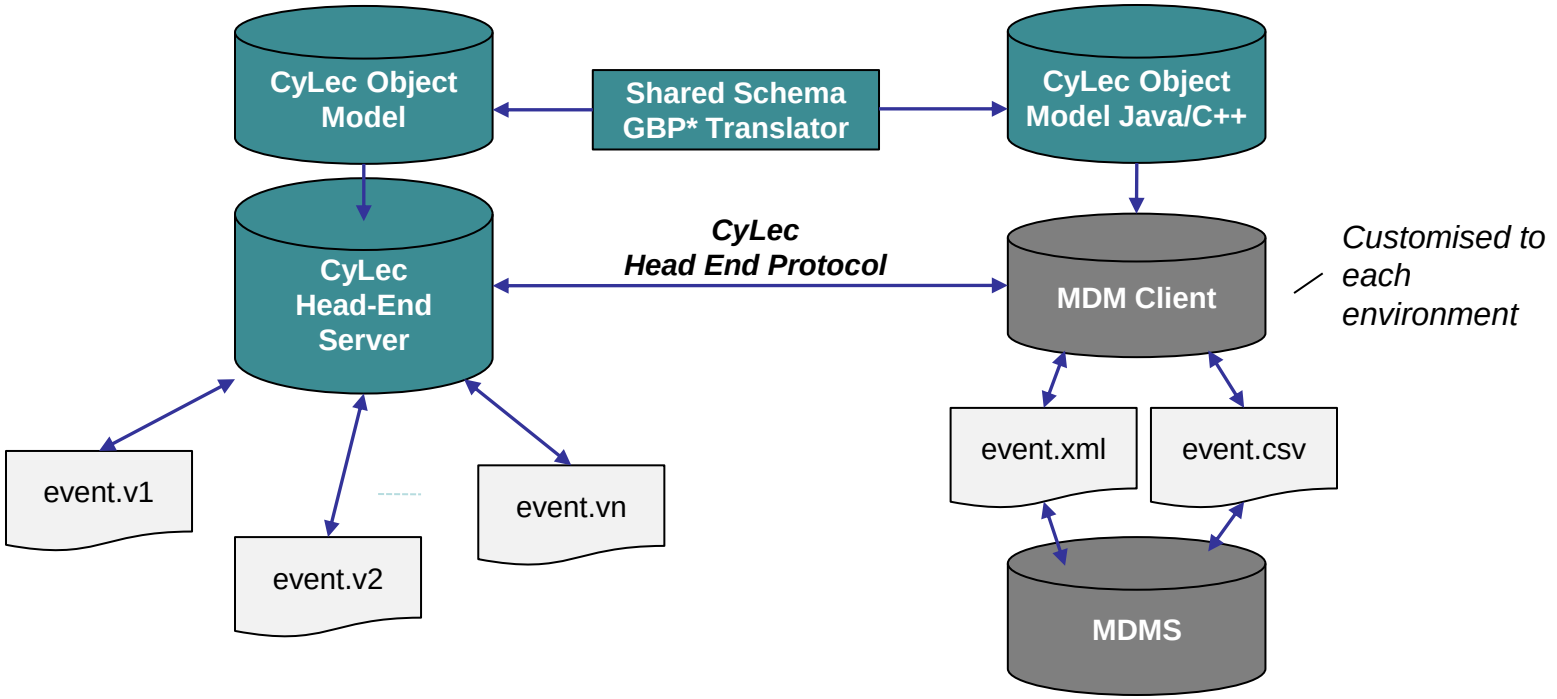
- Highlights
  - Concentrates radio traffic for up to 100 meters
  - Stores protocols for multiple meter types
  - Schedules collection of readings and status reports from meters
  - Forwards server messages to individual meters (e.g. disconnects)
  - Maintains private dynamic IP connection to the CyLec server

CyLec® platform – server software

- Highlights
  - Enterprise environment: robust, scalable and fault tolerant
  - Manages GPRS links to remote concentrators
  - Stores data from meters
  - Aligns multiple meter formats to common CyLec object model
  - Head-end interface to MDAS and MDMS
    - HTTPS RESTful – web services connections
    - Multiple export formats (Google Protocol Buffers and xml)
    - SSL transport encryption and authentication

CyLec® platform – flexible head end interface

- Exchange with Meter Data Management System
  - MIOS format XML (Indian standard)
  - MDM specific (e.g. Oracle)



*GPB: Google Protocol Buffers

CyLec® platform – benefits summary

- Automated collection of billing reports and meter history
- Automated collection of 15/30/60 minute load surveys
- Tariff management and reporting
- Near real-time tamper monitoring
- Remote disconnects:
  - Batched for non-payment or tampering
  - Scheduled for load management

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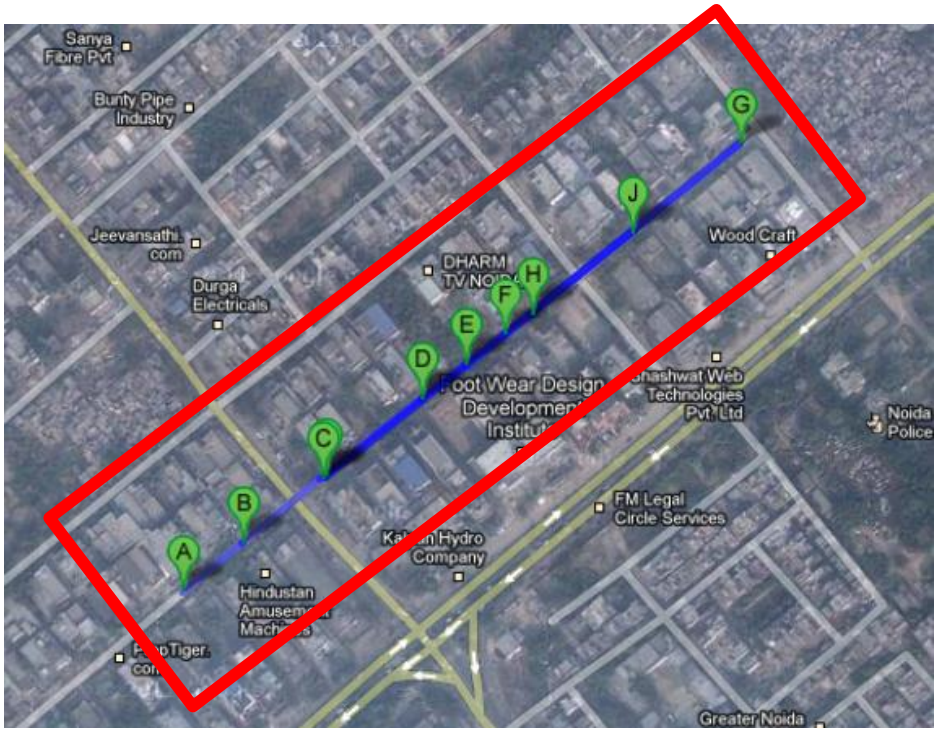
Pilot installation

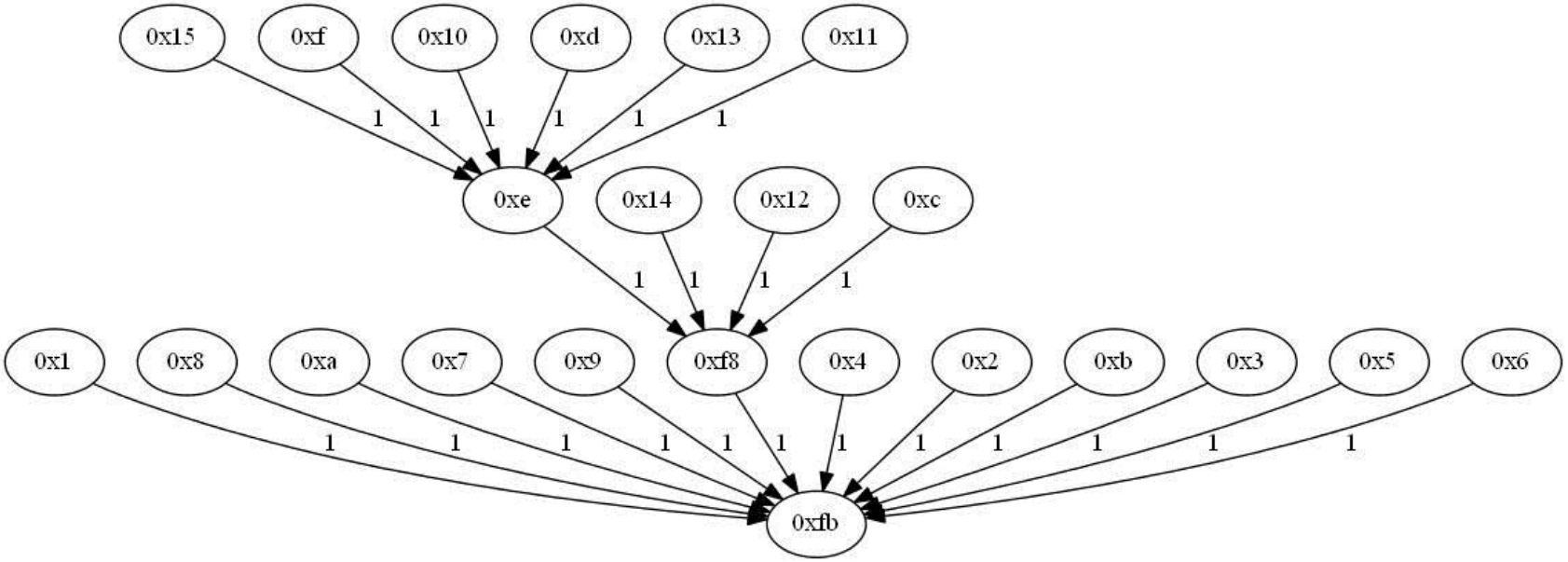
- Noida (New Delhi) pilot
  - 150 meters
  - 4 concentrators
  - 865-867MHz, 50mW LPRF



Location of sub-set of pilot meters

CyLec® platform – mesh operation

- Example of one mesh network connection network for Noida installation



CyLec® platform – meter management console

Summary – why Cyan?

- Fully integrated end to end mesh based wireless solutions
- Optimised for range and data
- Products are ready to use or easily customised
- Application specialised protocols
- Products developed jointly with OEM
- Available now

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