INFN + NI Collaboration Agreement

Augusto Mandelli
Scientific Research & Big Physics Manager, Europe
National Instruments

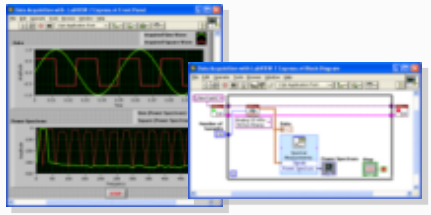
NATIONAL INSTRUMENTS

National Instruments - What We Do

NI combines graphical programming software with modular hardware, leveraging the latest technologies.

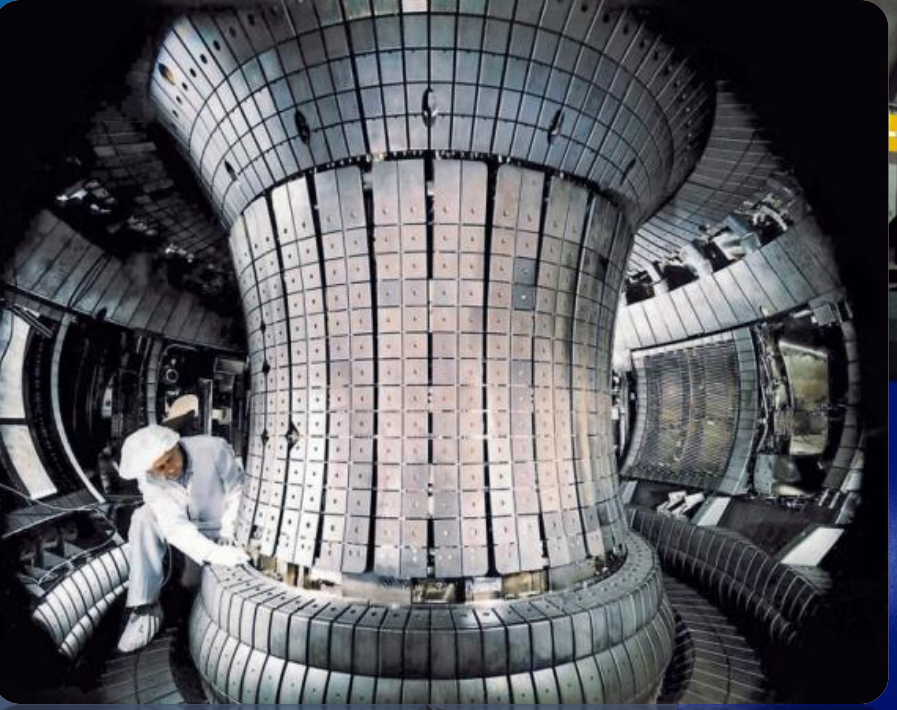
Low-Cost Modular Measurement and Control Hardware

Productive Software Development Tools

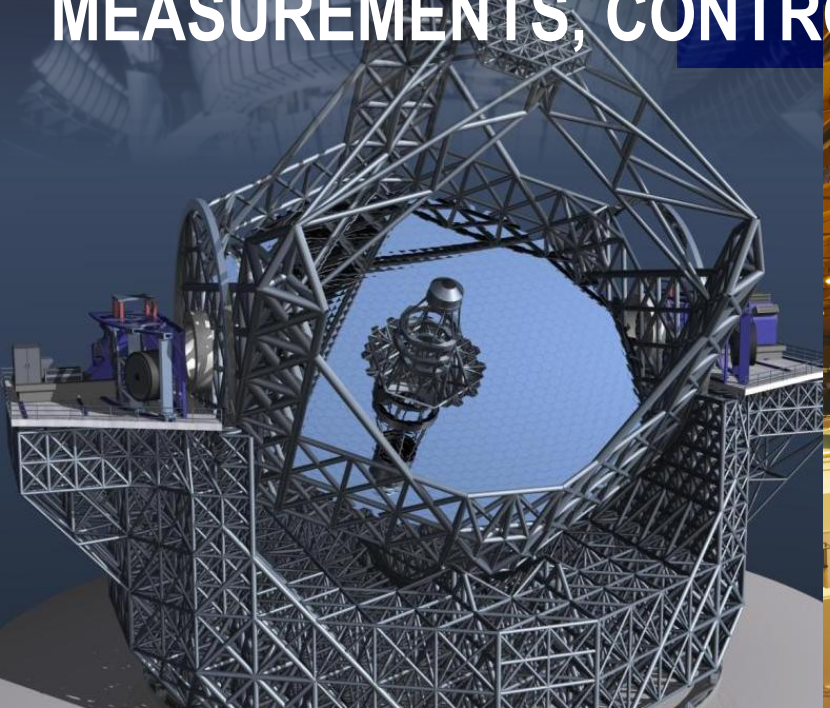


Highly Integrated Systems Platforms

Diversity of Applications – Multitude of Benefits

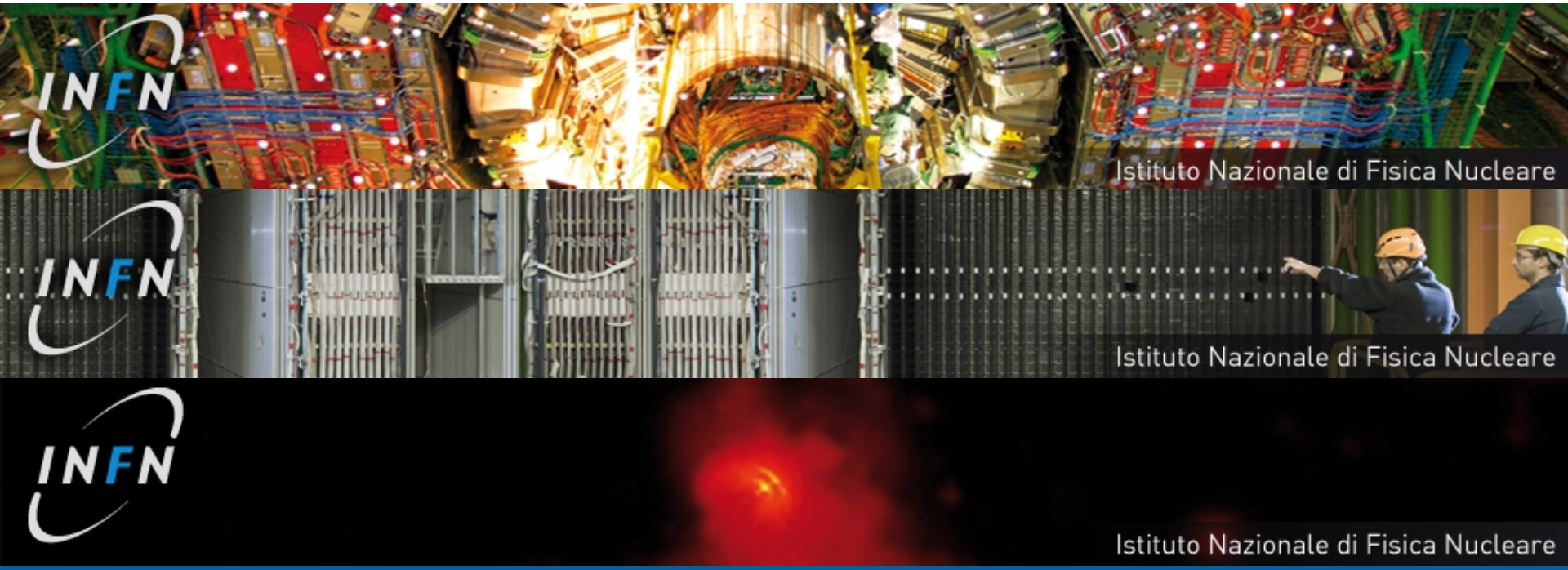


MEASUREMENTS, CONTROL AND DIAGNOSTICS

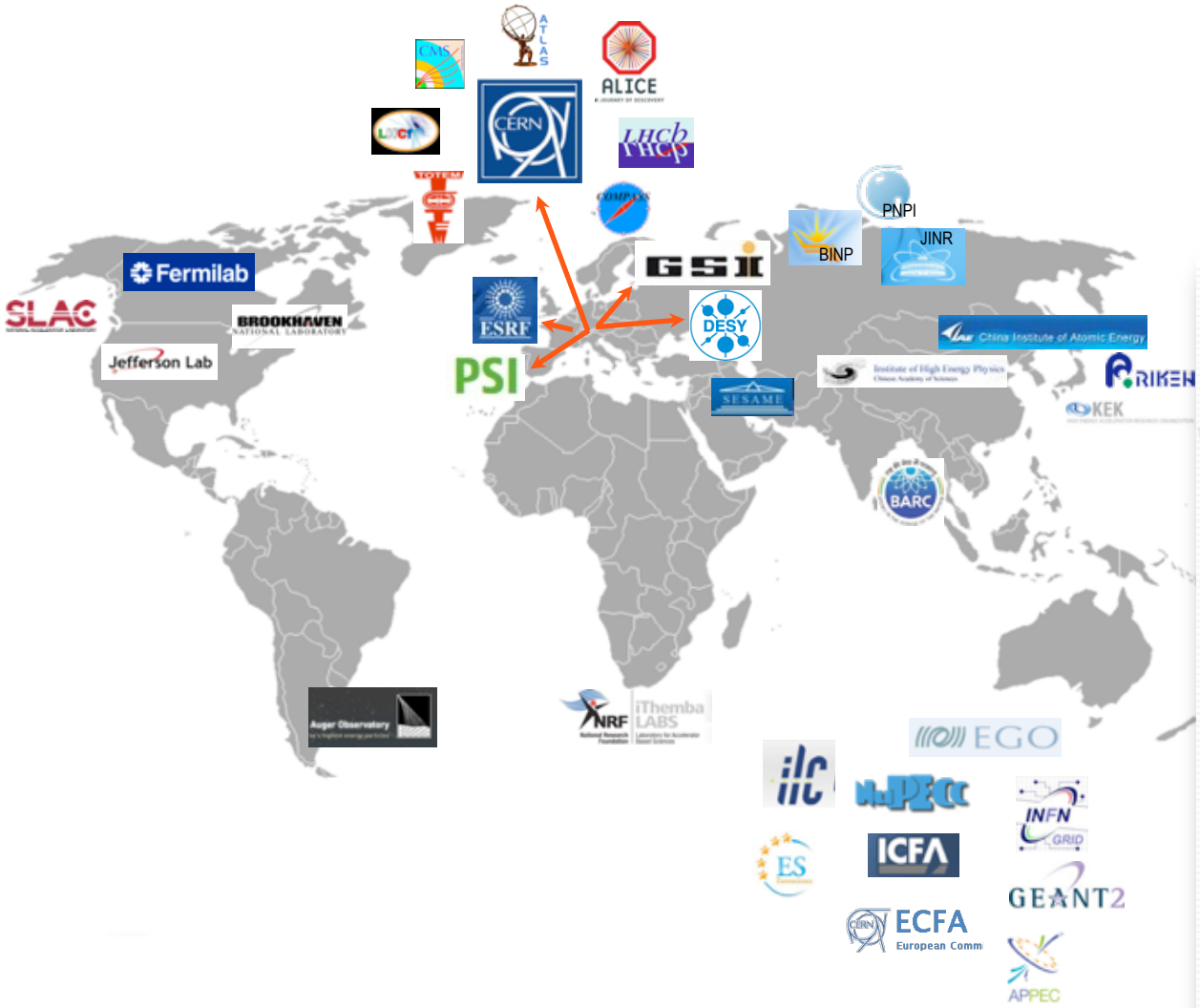


INFN – What We Do

INFN is the Italian research agency dedicated to the study of the fundamental constituents of matter and the laws



INFN and Big Physics around the Globe



WHY A COLLABORATION AGREEMENT

Good excuse for a beer:30!

Rationale behind : NI

NI Goals

- Leverage basic research to validate and test latest technologies & concepts (SkyLine, Big Analog Data - BAD,..)
- Get an R&D uplift effect
- Push NI platform at LSI – from FPGA-enabled PXIe through cRIO all the way down to Tecate

NI Strength Points

- Product certification and in-depth testing – same products used in other critical applications e.g medical applications
- RASM – Reliability, Availability, Serviceability and Maintainability
- Long term support strategy (10+ years)
- Full blown Linux roadmap in place
- A focused SR&BP Team and Strategy do exist
- NI already collaborate with most known WW Facilities and Experiments

Rationale Behind: INFN

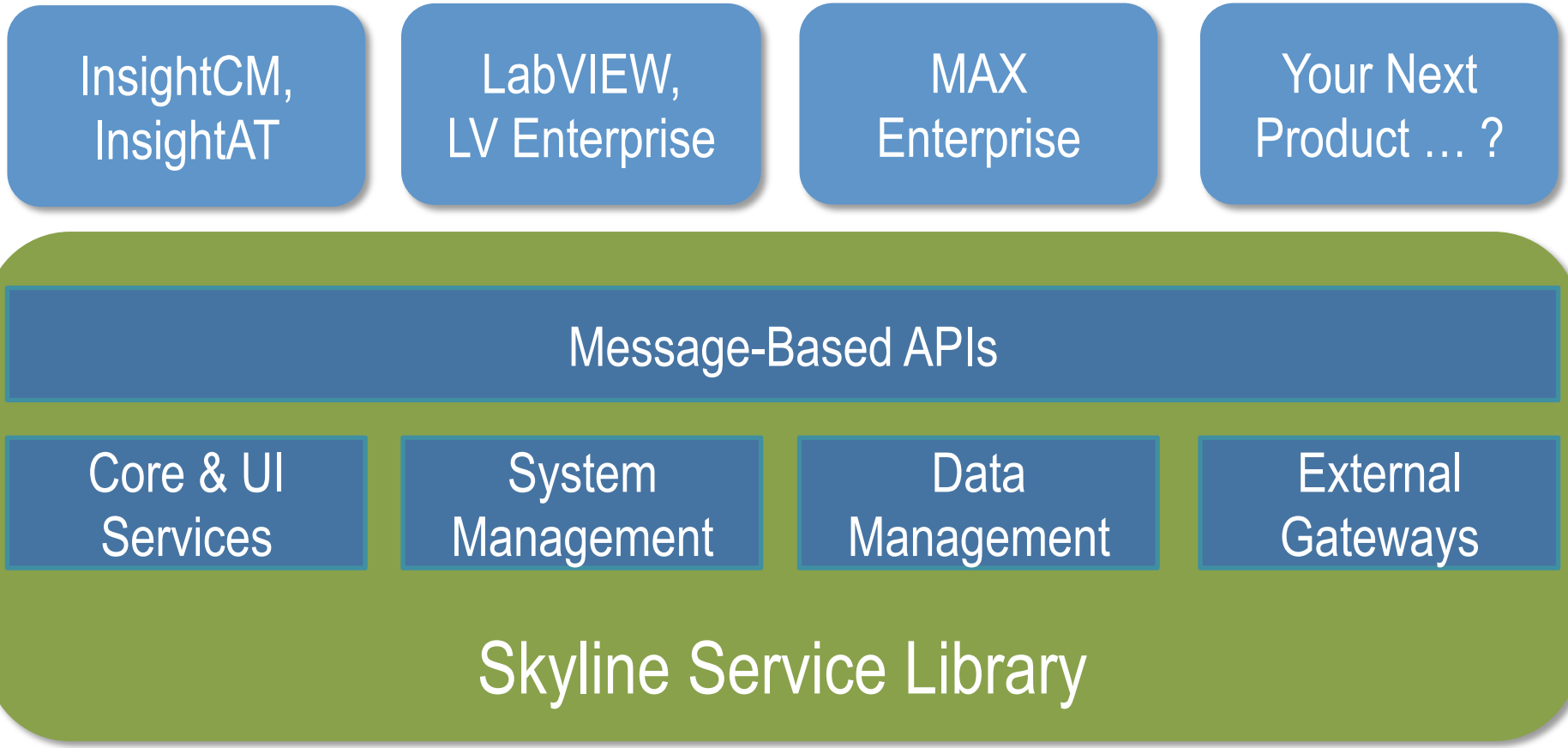
INFN Goals

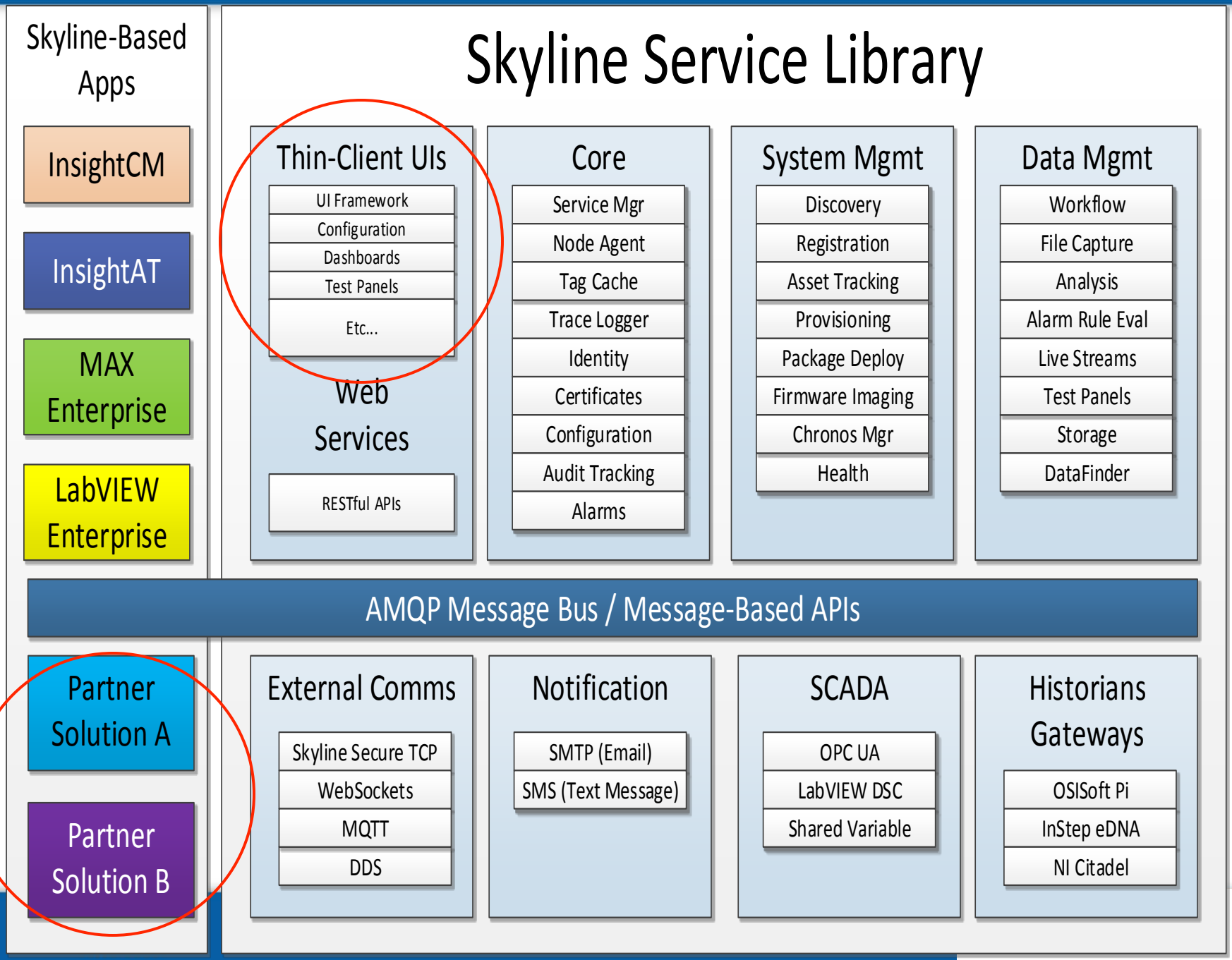
- Gain a preferential path towards the industrial world
- Help to better define and assess “buy vs build” policies
- Bring !CHAOS R&D project to an adequate level of maturity
- establish a relationship of trust and exchange for the hardware/software development plans, their application, long term support, optimization, and more

INFN Strength Points

- INFN is a top class Research Lab in HEP >> branding effect, increased credibility
- Present and future participation/investments in the construction of major equipment for big physics and application for society - health, computing…
- !CHAOS is an approved and funded R&D by Italian ministry of research project intersecting one or more NI strategic areas (BAD, asset management)

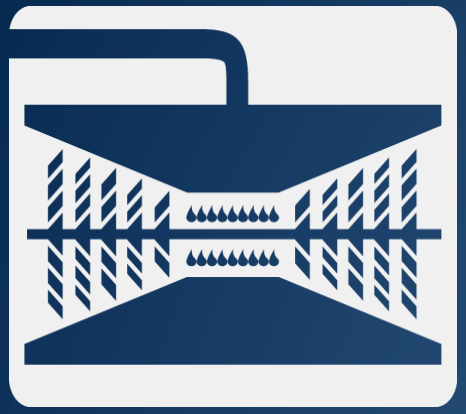
Skyline: 50,000 Foot Architectural View



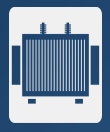

Skyline-Based Apps
InsightCM
InsightAT
MAX Enterprise
LabVIEW Enterprise
Partner Solution A
Partner Solution B
Skyline Service Library
Thin-Client UIs
UI Framework
Configuration
Dashboards
Test Panels
Etc...
Web Services
RESTful APIs
Core
Service Mgr
Node Agent
Tag Cache
Trace Logger
Identity
Certificates
Configuration
Audit Tracking
Alarms
System Mgmt
Discovery
Registration
Asset Tracking
Provisioning
Package Deploy
Firmware Imaging
Chronos Mgr
Health
Data Mgmt
Workflow
File Capture
Analysis
Alarm Rule Eval
Live Streams
Test Panels
Storage
DataFinder
AMQP Message Bus / Message-Based APIs
External Comms
Skyline Secure TCP
WebSockets
MQTT
DDS
Notification
SMTP (Email)
SMS (Text Message)
SCADA
OPC UA
LabVIEW DSC
Shared Variable
Historians Gateways
OSISoft Pi
InStep eDNA
NI Citadel

NI InsightCM - Power Plant Example

Turbines



Balance of Plant Assets


Transformers

Boilers

Radiators

Valves

Motors

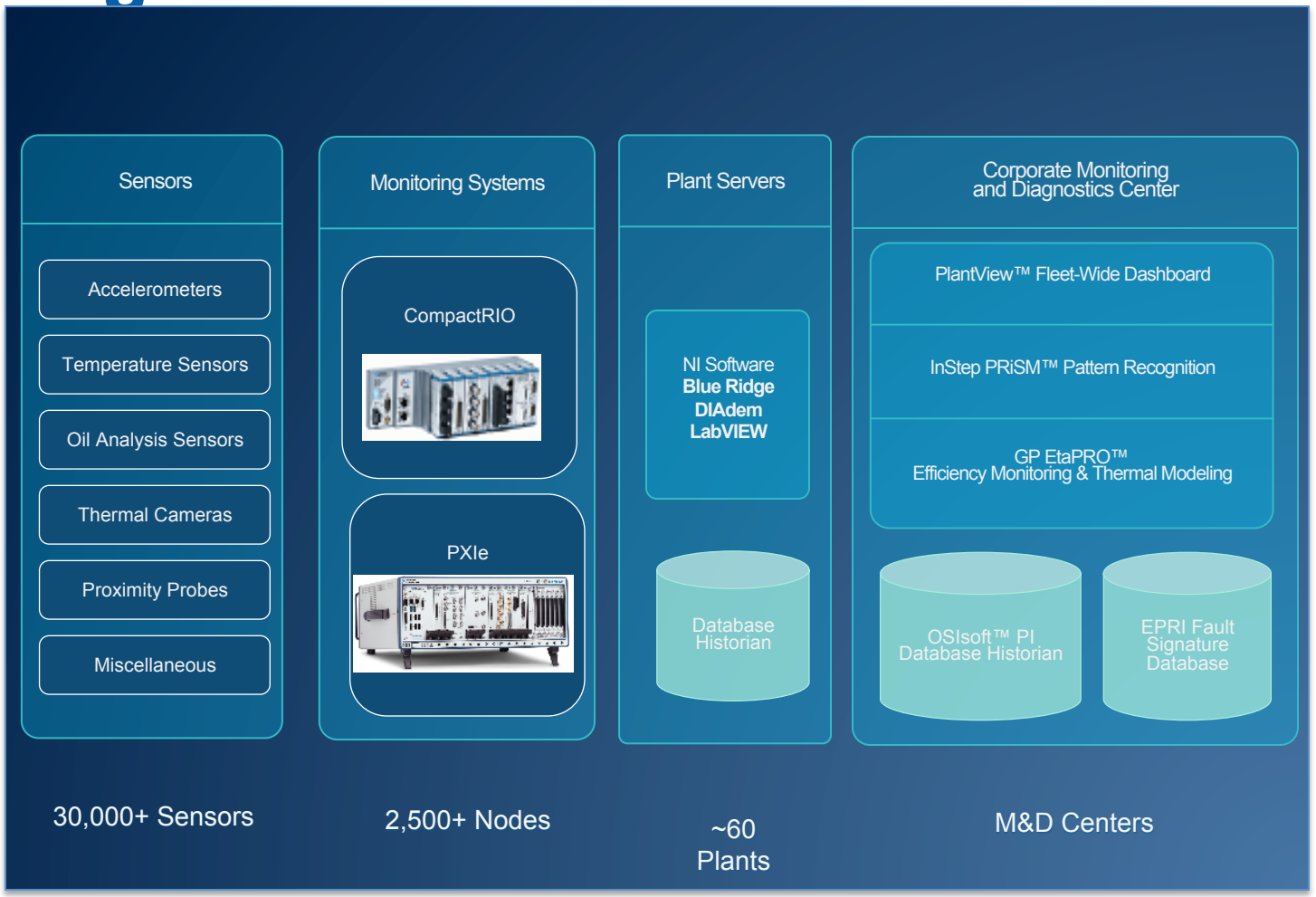
Pumps

Fans

Generators

10,000+ Fossil Generation Assets

NI InsightCM Architecture



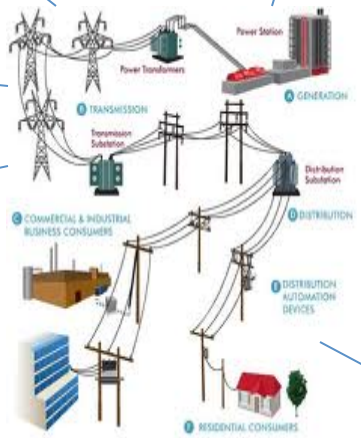
Smart Grid (Transmission & Distribution)

Transformer Monitoring

Alarm Event Recorder

Recloser Control

Sectionalizer Control



Phasor Measurement Unit

Capacitor Control

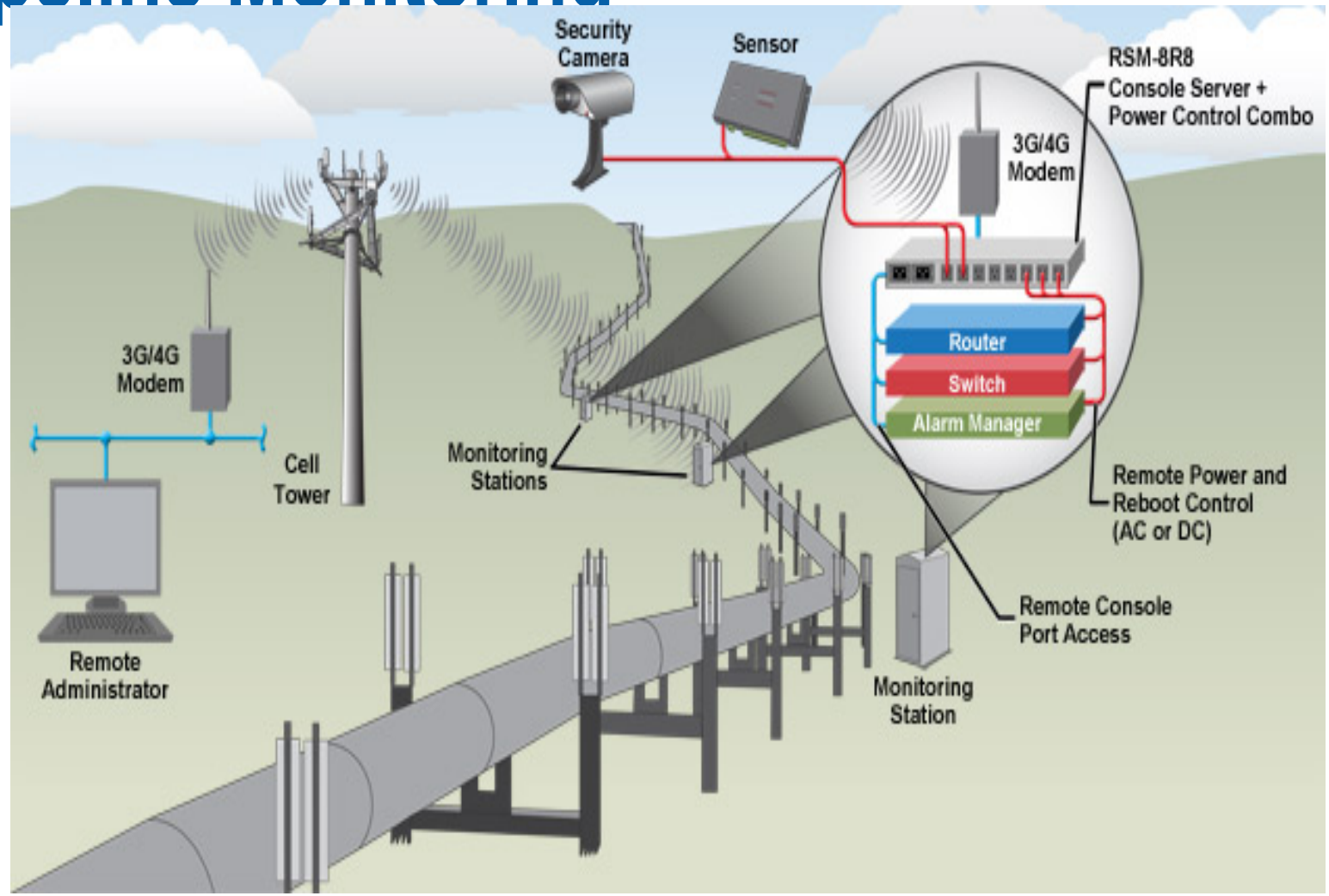
Substation Automation

Demand Response

Metering

Power Quality Analyzer

Pipeline Monitoring



INFN

NATIONAL
INSTRUMENTS™

INFN