NIDays

Andrej Drozg

Sales Manager

NI

09:00	Tematski uvod - You and NI Are Creating The Internet of Things Andrej Drozg National Instruments Dvorana: Grand hall - ground floor		
10:15	Tehnička stanka/Stanka za kavu		
	Slijed 1. Dvorana: Grand Hall		Slijed 2. Dvorana: Premium I-II-III.
10:45	Novi softverski oblikovani instrumenti za automatizirano ispitivanje Damjan Drozg National Instruments	10:45	Temperaturno i vibracijsko („Shake & Bake“) ispitivanje „Mobile Base Control Unit - MBCU“ elektroničkih uređaja korištenih u robotskim strojevima za razminiranje/vatrogastvo, upotrebom CompactDAQ hardvera i LabVIEW softvera Krešimir Hercigonja DOK-ING Ltd.
		11:10	Prijenosni autonomni logeri i resenja za vizualnu inspekciju Mitja Gliha Versarum
11:35	Prikaz najnovijih programabilnih automacijskih kontrolera s otvorenim operativnim softverom Andrej Drozg National Instruments	11:35	Unaprijedite mogućnosti vaših DAQ aplikacija R serijom Andrej Korošec National Instruments
12:15	Ručak		

13:15	Tematski uvod - You and NI Will Solve the Engineering Grand Challenges Andrej Drozg National Instruments Dvorana: Grand hall - ground floor		
14:00	Tehnička stanka		
14:15	Automatsko upravljanje strojem za etiketiranje; optička inspekcija etiketa i naljepnica; statistika rada i izvještaji Ivan Pankretić Asemo d.o.o.	14:15	Radionica: Nastava NI myRIO u ugrađenim sustavima ili Radionica: LabVIEW u prikupljanju podataka i DIAdem za offline obradu signala Damjan Drozg, Andrej Korošec National Instruments
14:40	Razvoj sustava regulacije pametnog punjača i upravljanja tokovima energije za baterije i ultrakondenzatore Mario Hrgetić Sveučilište u Zagrebu		
15:05	Sustav za mjerenje toplinske vodljivosti praškastih materijala nestacionarnim osjetilom zasnovanim na tehnici "vruće žice". Dražen Čavužić TEVA Pharmaceutical Industries, PLIVA Croatia		
15:30	NI VirtualBench - 5 instrumenata u jednom uređaju Rostislav Halaš National Instruments		
15:50	Stanka za kavu		
16:20	Virtualni instrumenti za mjerenje i prikaz elektromiografskog signala koristeći prijenos signala putem ljudskog tijela Ivan Babić Sveučilište u Zagrebu	16:20	Radionica: Nastava NI myRIO u ugrađenim sustavima ili Radionica: LabVIEW u prikupljanju podataka i DIAdem za offline obradu signala Damjan Drozg, Rostislav Halaš National Instruments
16:45	MioDent-elektromiografsko/poligrafski uređaj za dentalne aplikacije Velimir Išgum Fakultet elektrotehnike i računarstva - FER		
17:10	Ispit za "Certified LabVIEW Associate Developer" (CLAD)		

DOK-ING

DON'T SEND A MAN TO DO A MACHINE'S JOB

PLIVA

UNIVERSITAS STUDIORUM ZAGRABIENSIS MDCLXIX

FSB

FER

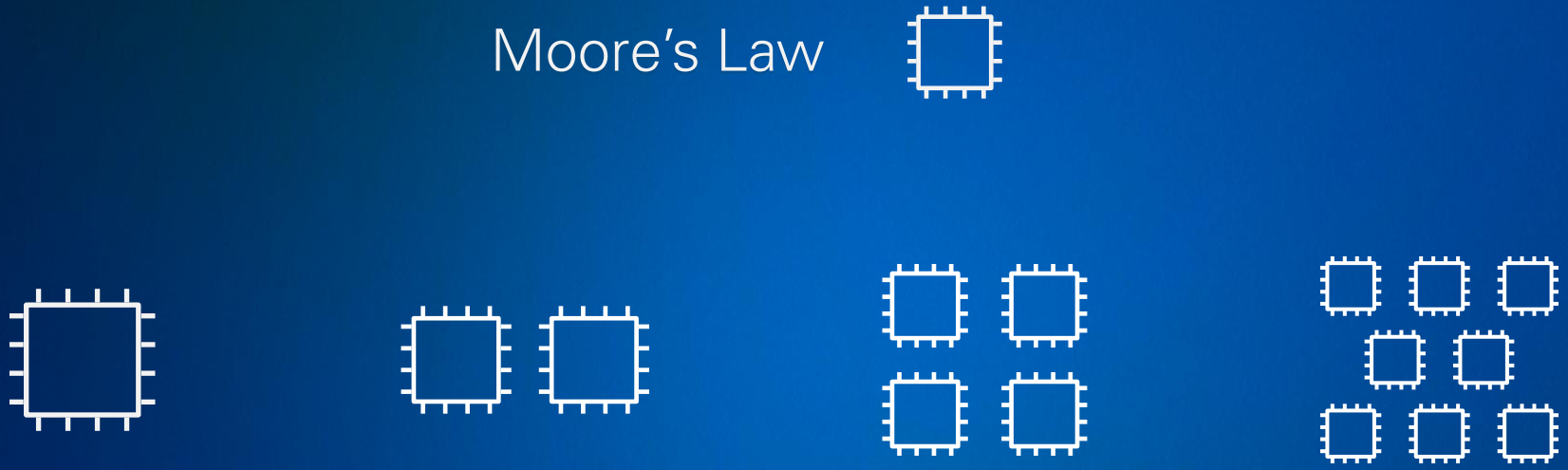
ASEMO

industrial automation

VERSARUM

PRAVNE DEJAVNOSTI IN SISTEMSKE INTEGRACIJE, d.o.o.

Moore’s Law



Metcalfe’s Law

Battery Life

Wireless

1G

2G

3G

4G

Sensors

Accelerometer

Encoder

Strain

Microphone

The Internet of Things

Moore's Law

Metcalfe's Law

Battery Life

Wireless

Sensors

INDUSTRIAL
Internet of Things

SMART

Factory

Grid

Machine

City

Car

Connectivity
Data Analytics

CONSUMER
Internet of Things

SMART

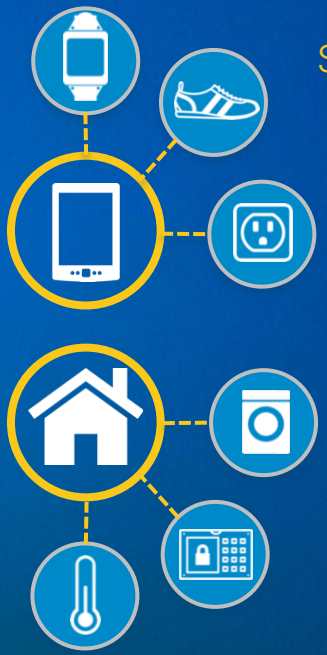
Phone

Wearable

TV

Appliances

Home



Based on Moor Insights & Strategy's report "Segmenting the Internet of Things (IoT)"

P
2
HOUR
METER

INDUSTRIAL
Internet of Things

SMART

Factory

Grid

Machine

City

Car

Connectivity
Data Analytics

CONSUMER
Internet of Things

SMART

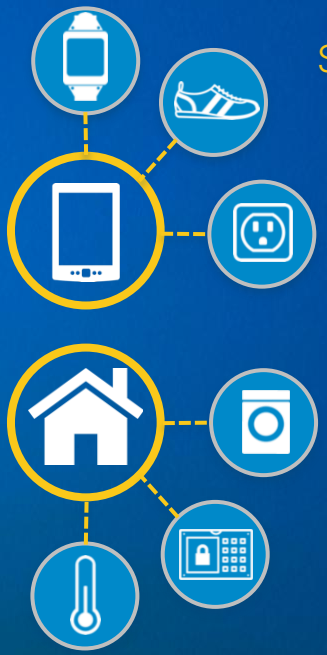
Phone

Wearable

TV

Appliances

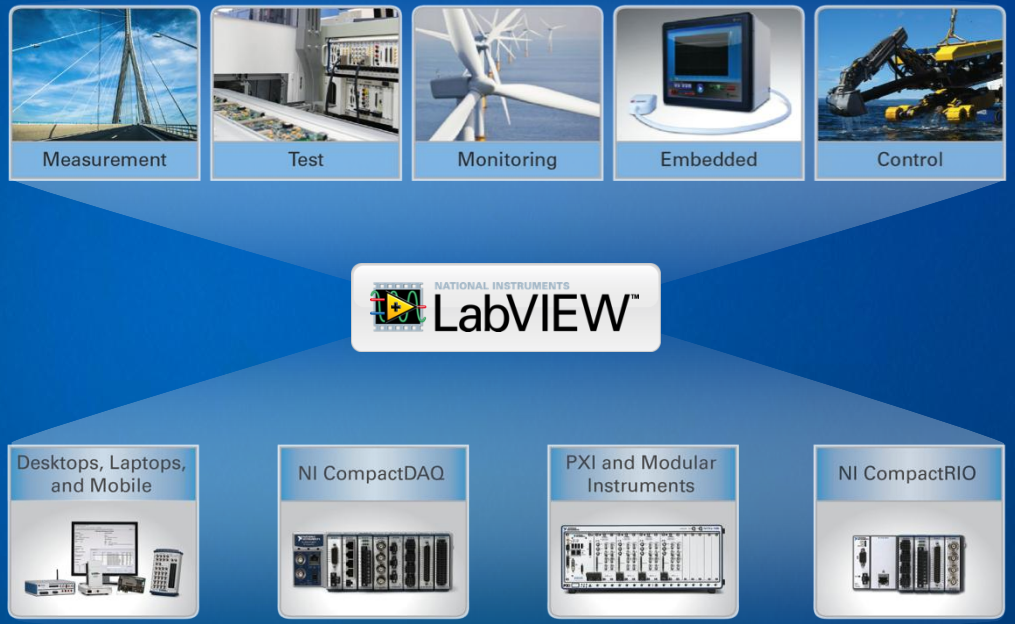
Home



Based on Moor Insights & Strategy's report "Segmenting the Internet of Things (IoT)"

You and NI Will Create the Internet of Things

Graphical System Design



Andrej Korosec

Applications Engineer

NI

LabVIEW 2014

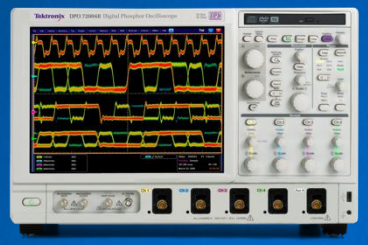
Almost 95% of Fortune 500

8,000 Classrooms

Top 20 5G Researchers

200

C Series modules

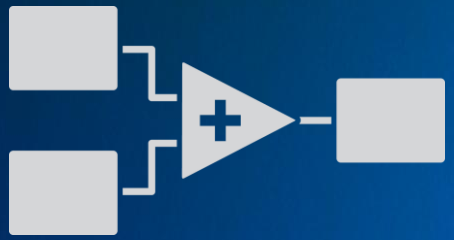


10,000

drivers

1,500

PXI modules



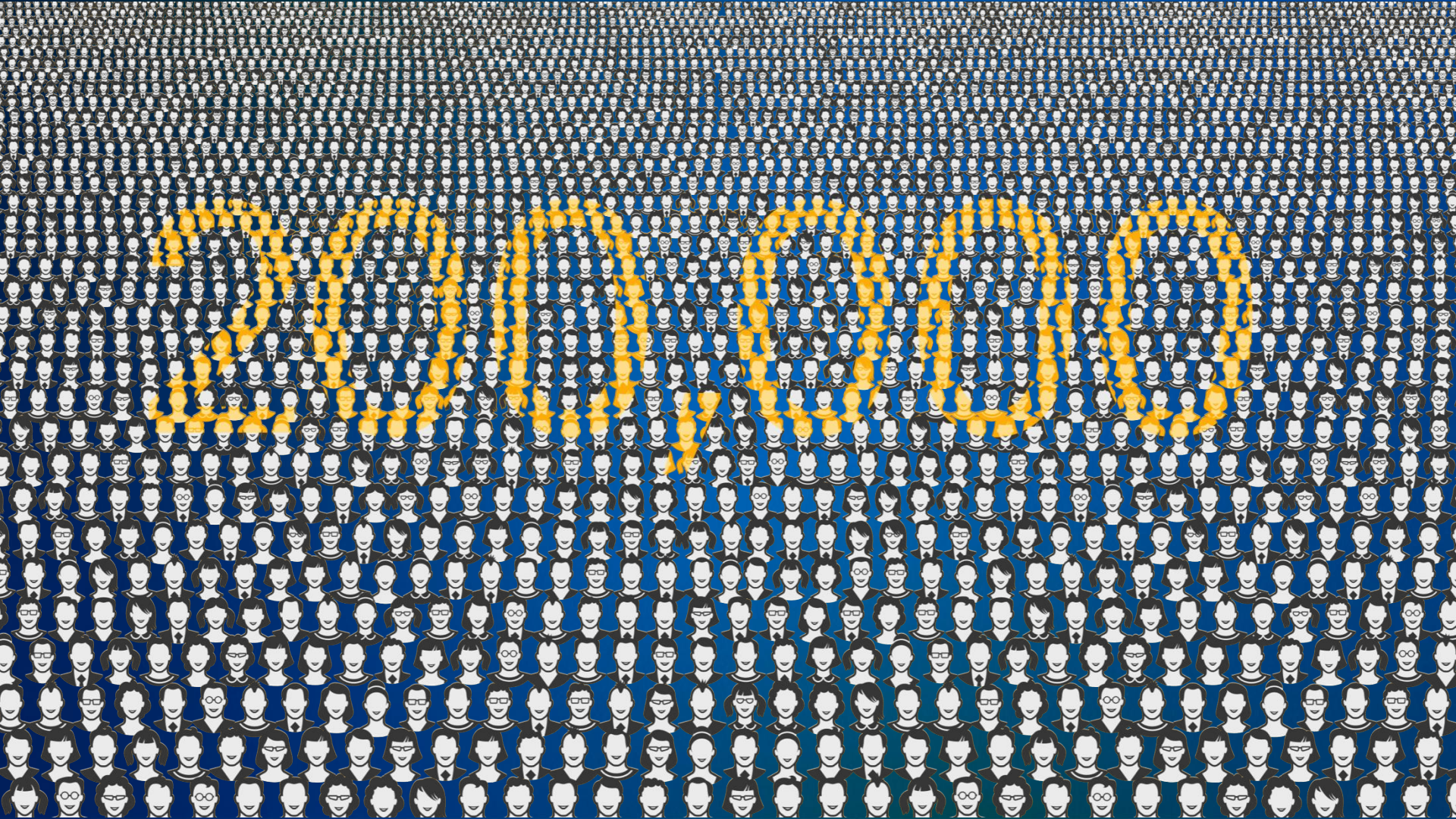
900

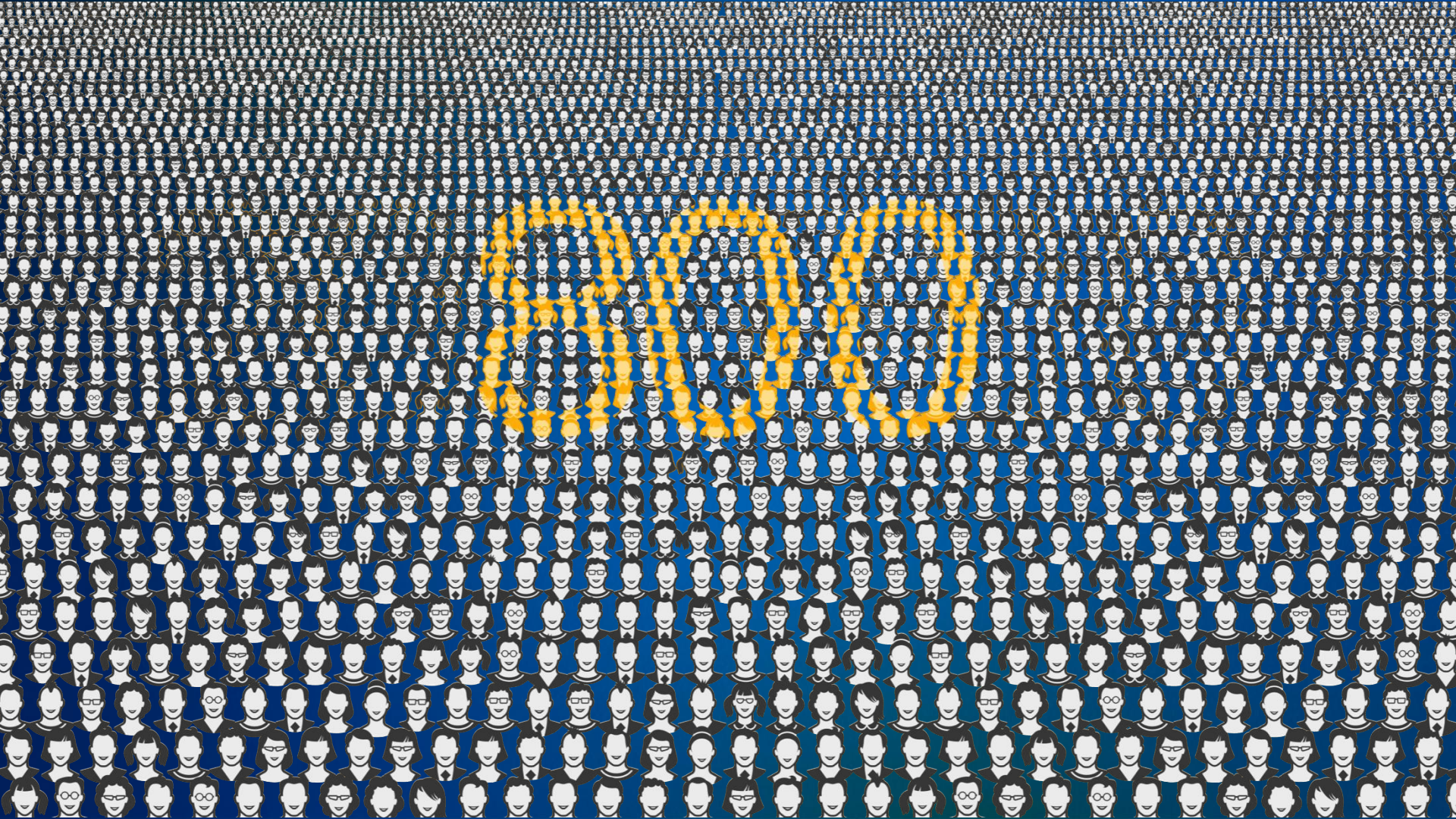
Graphical functions

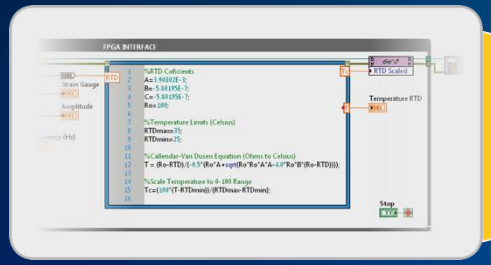
$y=f(x)$

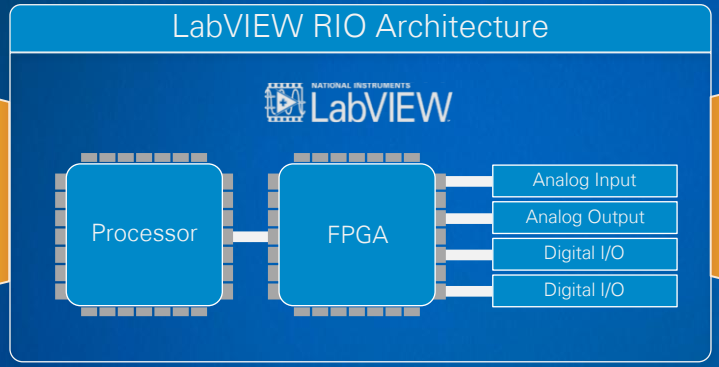
800

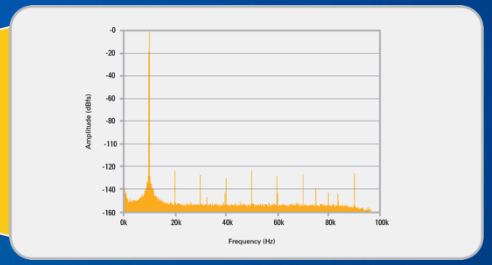
Text-based routines





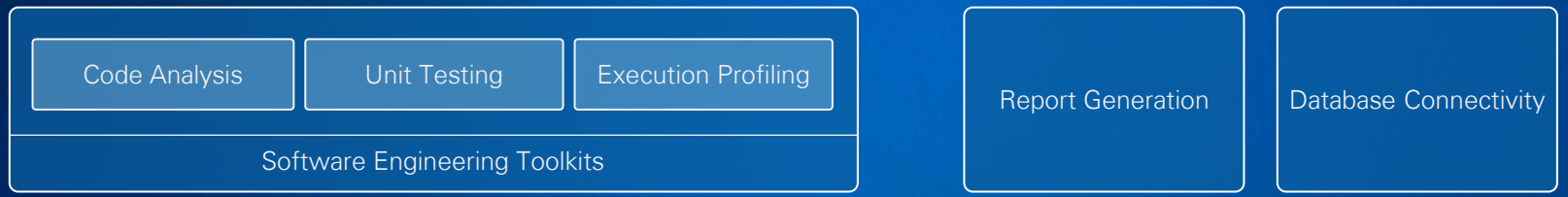

FPGA INTERFACE
%RTD Coficients
A=3.9083E-3;
B=-5.8019E-7;
C=-5.8019E-7;
Ro=100;
%Temperature Limits (Celsius)
RTDmax=35;
RTDmin=25;
%Callendar-Van Dusen Equation (Ohms to Celsius)
T = (Ro-RTD)./(-0.5*(Ro*A+sqrt(Ro^A^A-4.0*Ro*B*(Ro-RTD))));
%Scale Temperature to 0-100 Range
Tcs(100*(T-RTDmin))./(RTDmax-RTDmin);
RTD Scaled
Temperature RTD
Stop


LabVIEW RIO Architecture
NATIONAL INSTRUMENTS
LabVIEW
Processor
FPGA
Analog Input
Analog Output
Digital I/O
Digital I/O


Amplitude (dBfs)
0
-20
-40
-60
-80
-110
-120
-140
-160
0k
20k
40k
60k
80k
100k
Frequency (Hz)

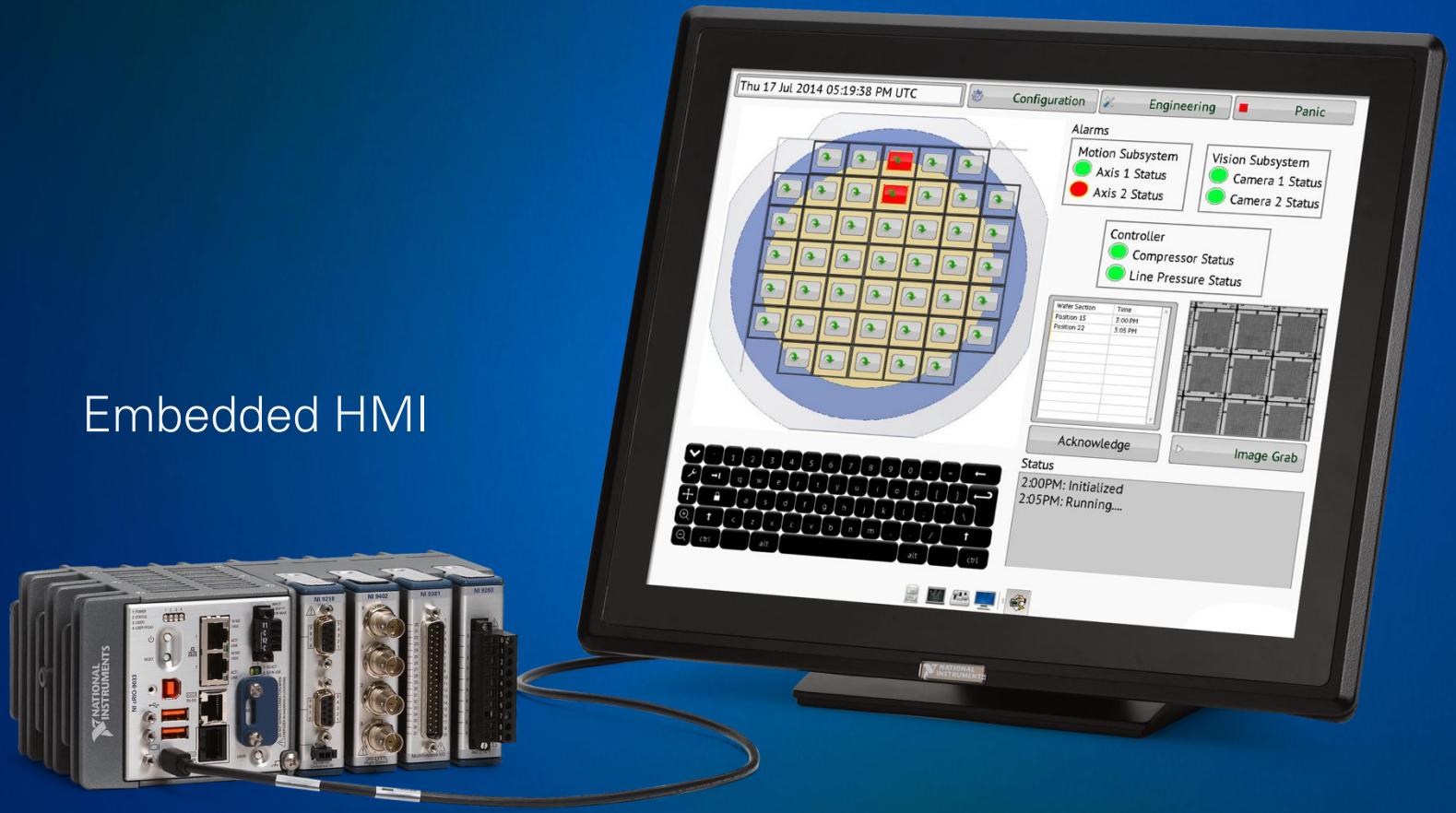
Code Analysis Unit Testing Execution Profiling Report Generation Database Connectivity

LabVIEW Professional Development System


Code Analysis
Unit Testing
Execution Profiling
Software Engineering Toolkits
Report Generation
Database Connectivity

IP Builder
Code Analysis
Unit Testing
Execution Profiling
Report Generation
Dat
IP Builder
Compile Cloud Service
LabVIEW Professional Development System
LabVIEW FPGA Module
Compile Cloud Service

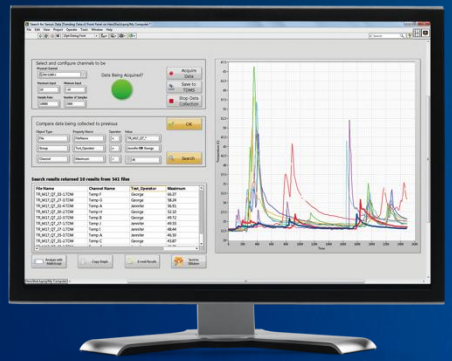
Embedded HMI



LabSocket System

The Easy Way to Extend LabVIEW to the Web

LabVIEW
TOOLS NETWORK

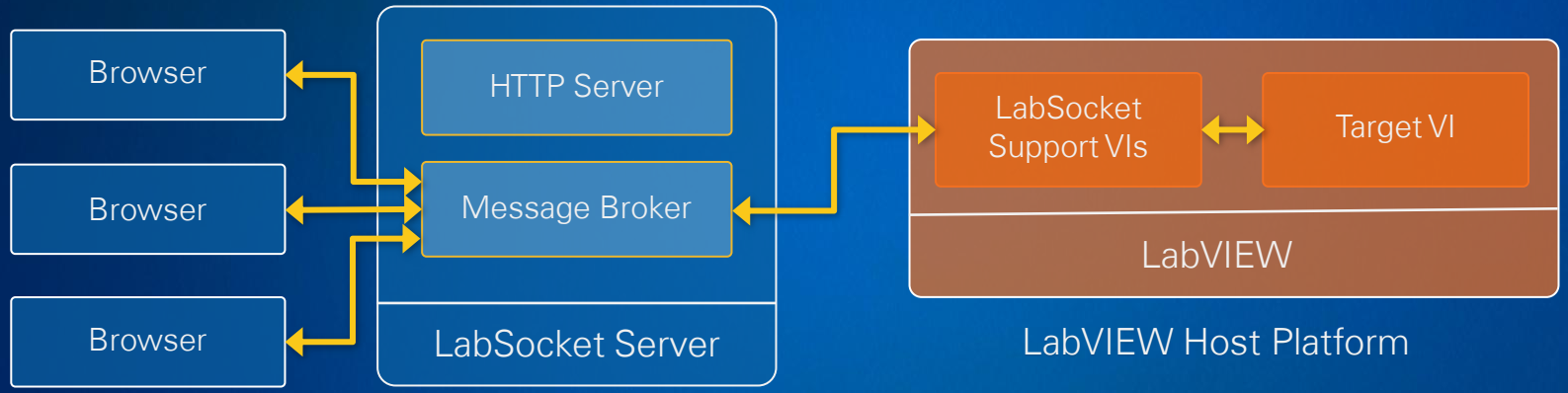


HTML

https://

LabSocket

The Easy Way to Extend LabVIEW to the Web

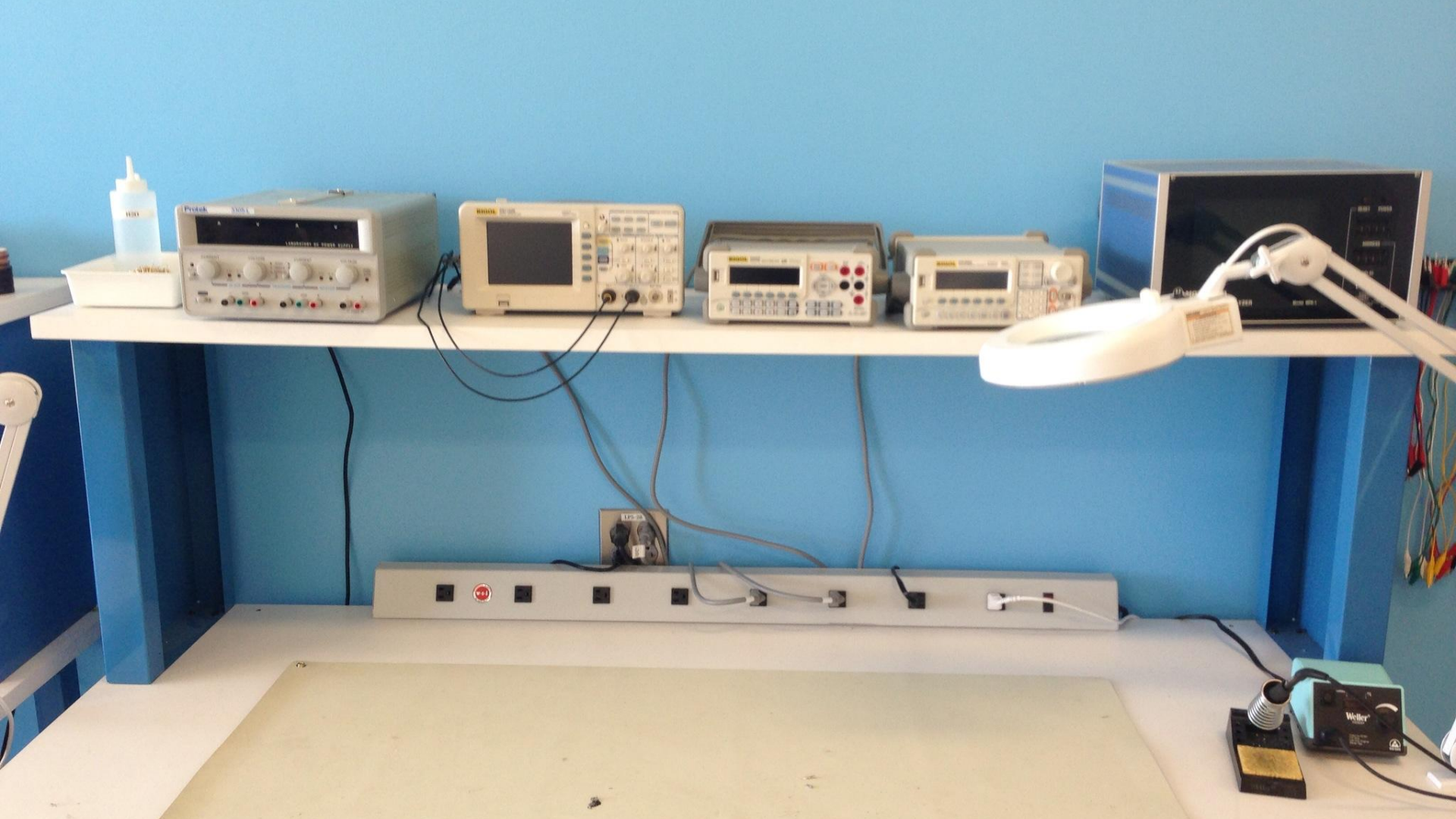


NATIONAL INSTRUMENTS
NATIONAL INSTRUMENTS
MC-DIO-24
LabWindows
User Manual
LabWindows
Standard Libraries
Reference Manual
LabWindows
Instrument Library
Developer's Guide
NATIONAL INSTRUMENTS
NATIONAL INSTRUMENTS
NATIONAL INSTRUMENTS
MC LabDriver
Start DAQ
Channel
Gain
Timebase
Sample Interval
Count
Data Buffer
error
1000
raw.data[]
daq.error
daq.error = DAQ_Start (3, 0, 1, raw.data[], 1000, 1, 25);
IBM

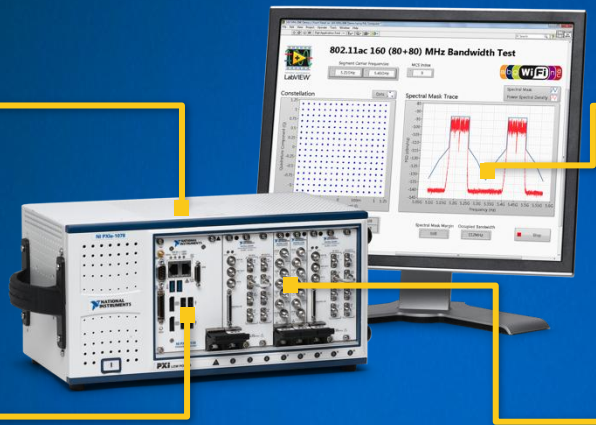
Damjan Drozg

Technical Sales Engineer

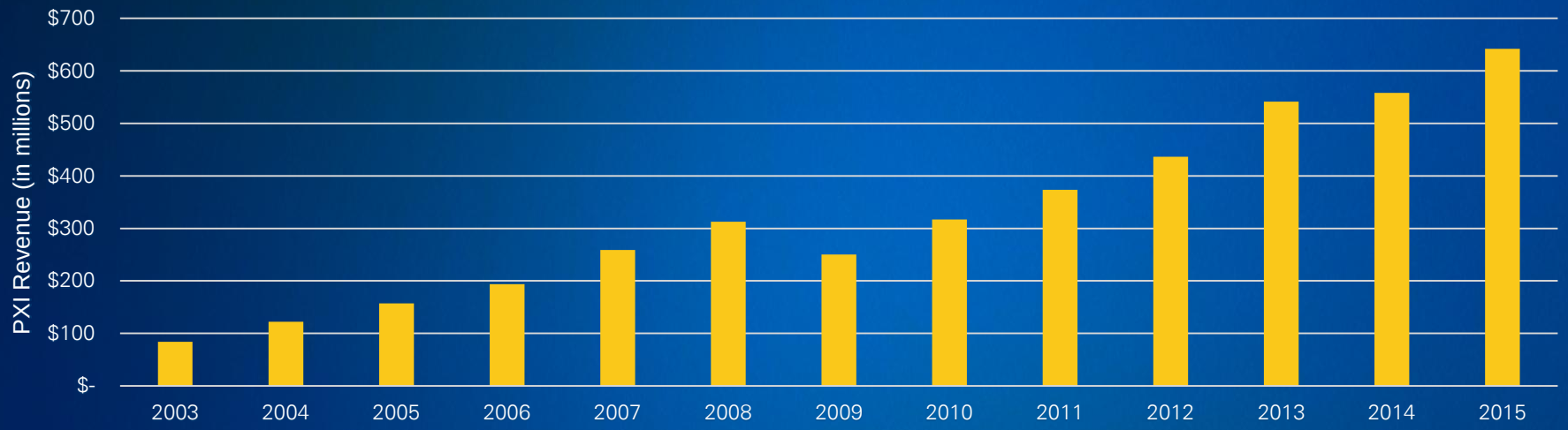
NI


Protek
Weller

NATIONAL INSTRUMENTS
VirtualBench
MIXED SIGNAL OSCILLOSCOPE
FGEN
TRIG
DIGITAL MULTIMETER
DC POWER SUPPLY
DIGITAL I/O
1.23456 V
1.2345 kHz
02.00 Vpp


PXI Chassis
Software
PXI Controllers
PXI Modules
802.11ac 160 (80+80) MHz Bandwidth Test
Constellation
Spectral Mask Trace

PXI Growth Continues…



Source: Frost & Sullivan, Prime Data, and NI Estimates

> "The global PXI-based instrumentation market in electronic test applications is expected to experience a compound annual growth rate of 17.6% from 2013 to 2020. By 2020, this market is expected to generate over $1,750 million."

—Frost and Sullivan, 2014

System Compare | PXI vs. Previous ATE

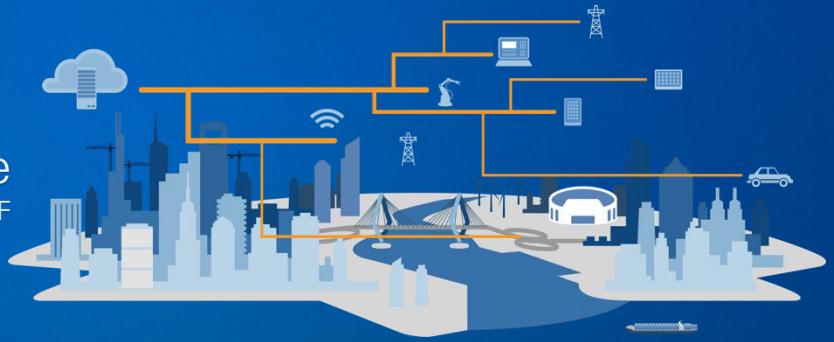
	PXI Tester	Reduction	Previous Solution
Cost	$40K USD	11X	$450K+ USD
Footprint	18 x 24 x 7 in.	15X	98 x 66 x 74 in.
Weight	30kg	66X	2000kg
Facility	600 W	16X	10 kW

Moore's Law

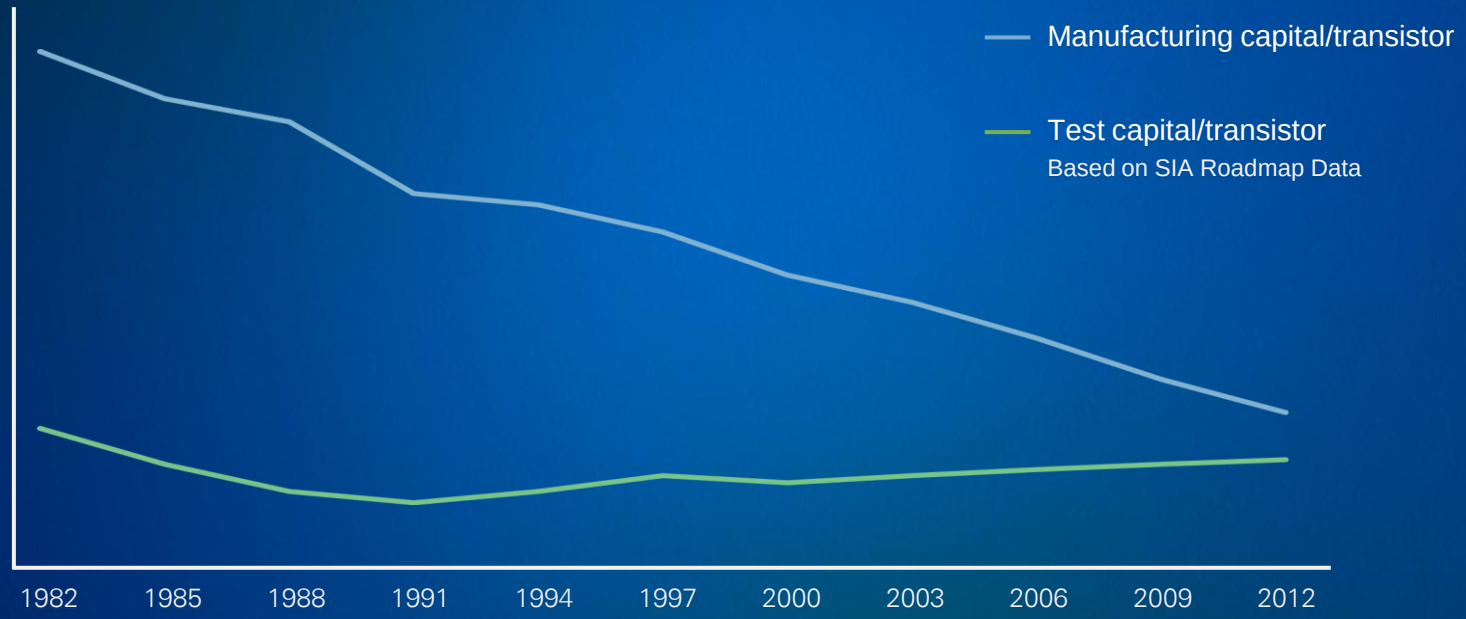
Digital

More Than Moore

Analog/RF



The Economics of Silicon Manufacturing and Test



Introducing the
Semiconductor Test System

RF Subsystem

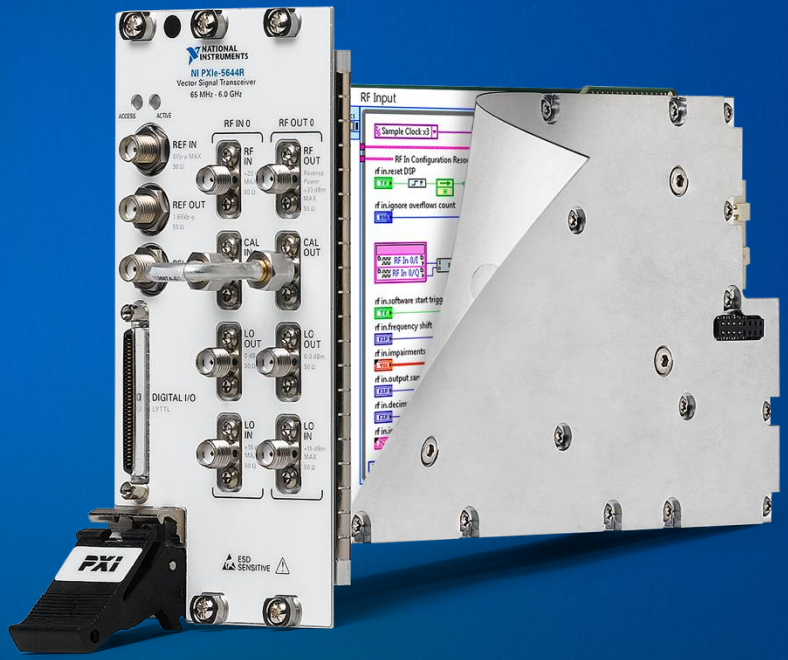
RF Ports

Port Modules

Vector Signal Transceiver

PXI Chassis

Software-Designed Instrumentation



Qualcomm ATHEROS

2012 Evolution of NI PXI RF

200X Shorter

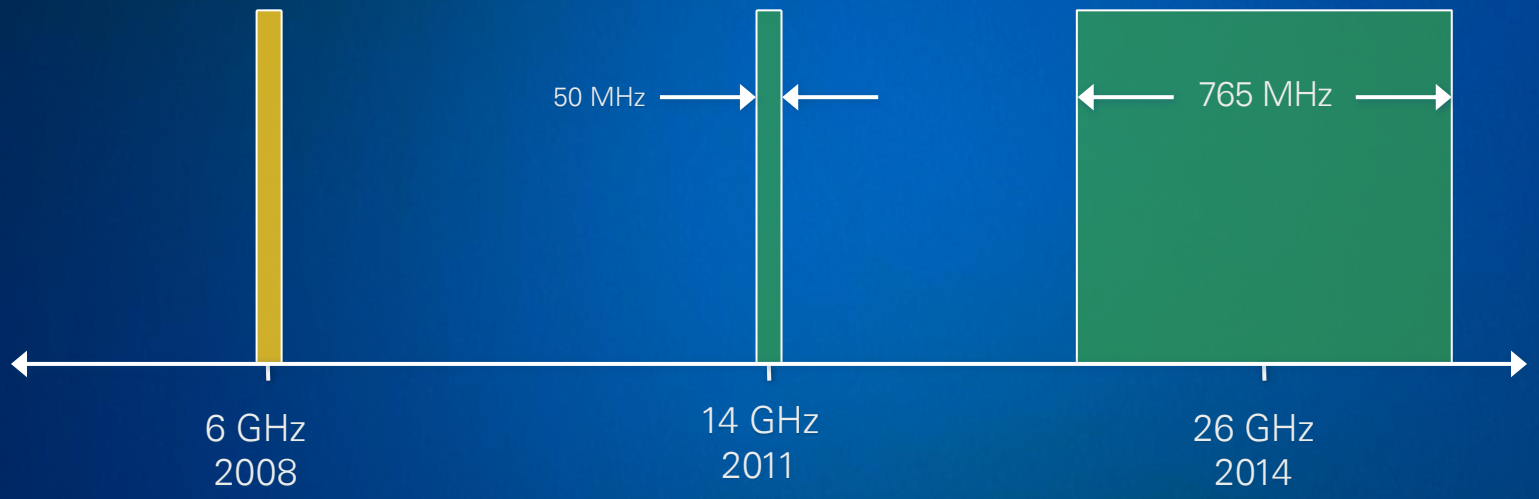
2007 NI PXI RF Instrumentation

10X Shorter

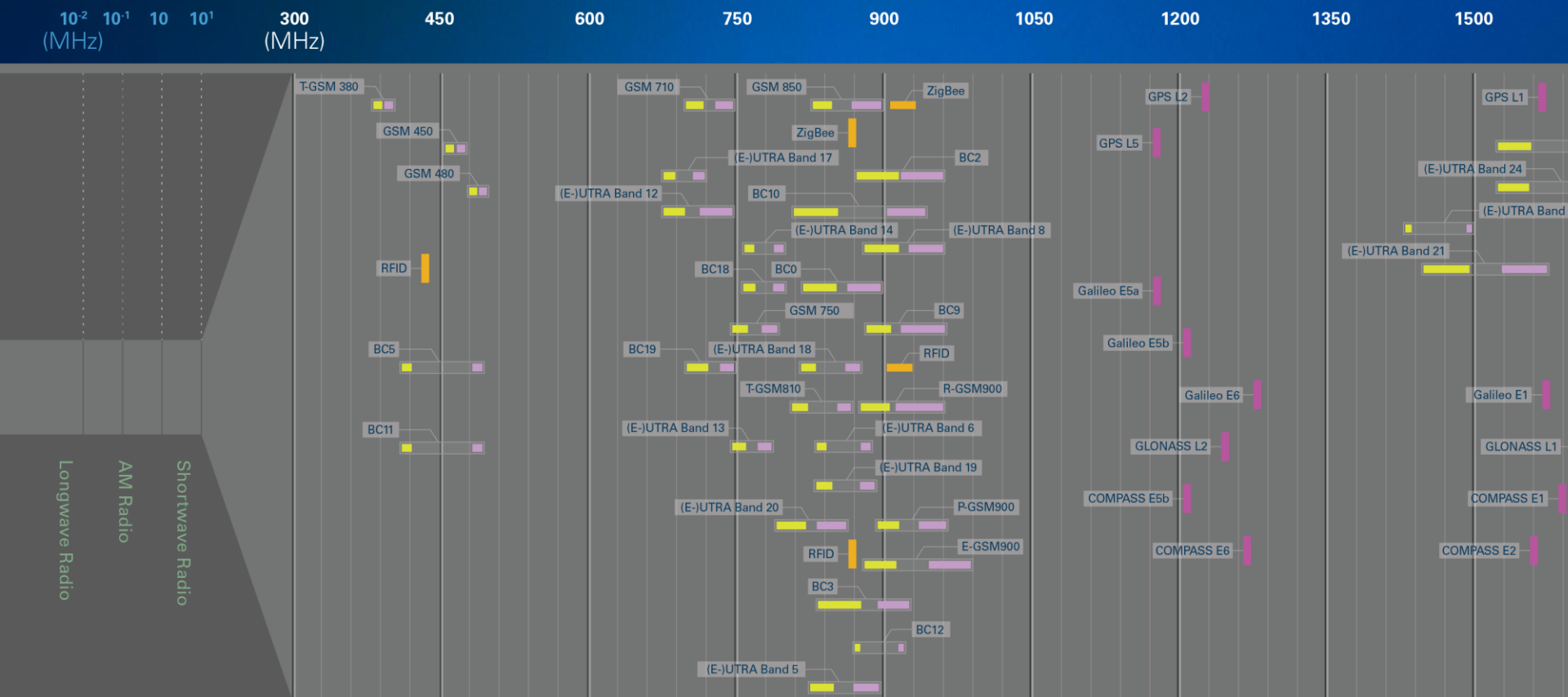
Traditional Rack and Stack

Traditional Test Time

NI Frequency and Bandwidth Coverage

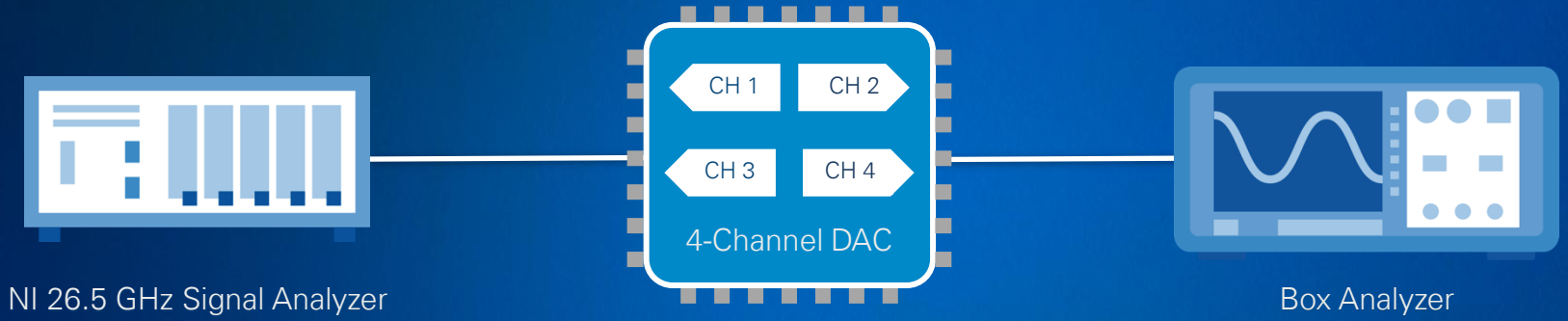


United States Spectrum Allocations

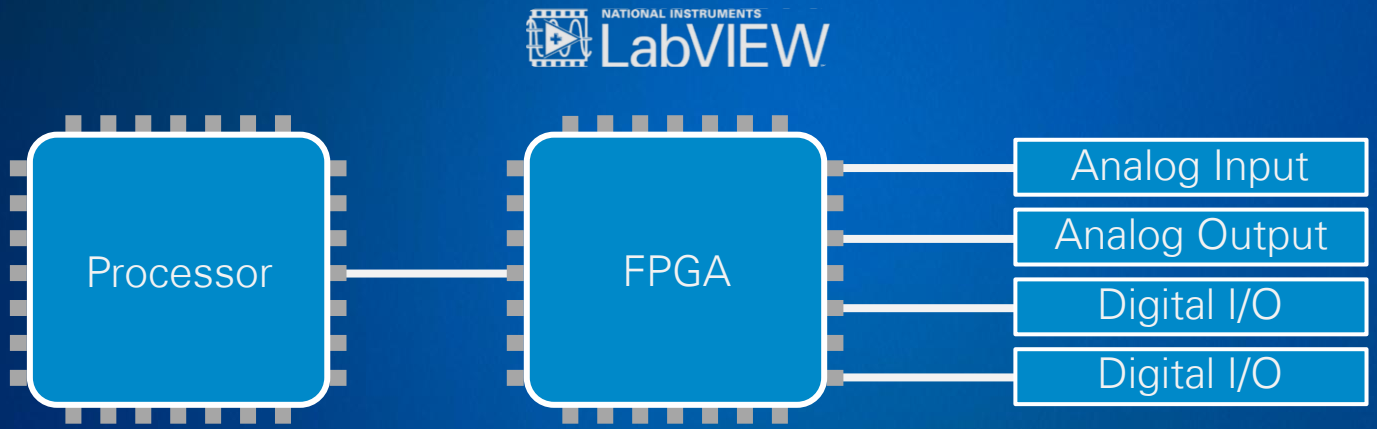


Design Engineer
Maximum instrument performance

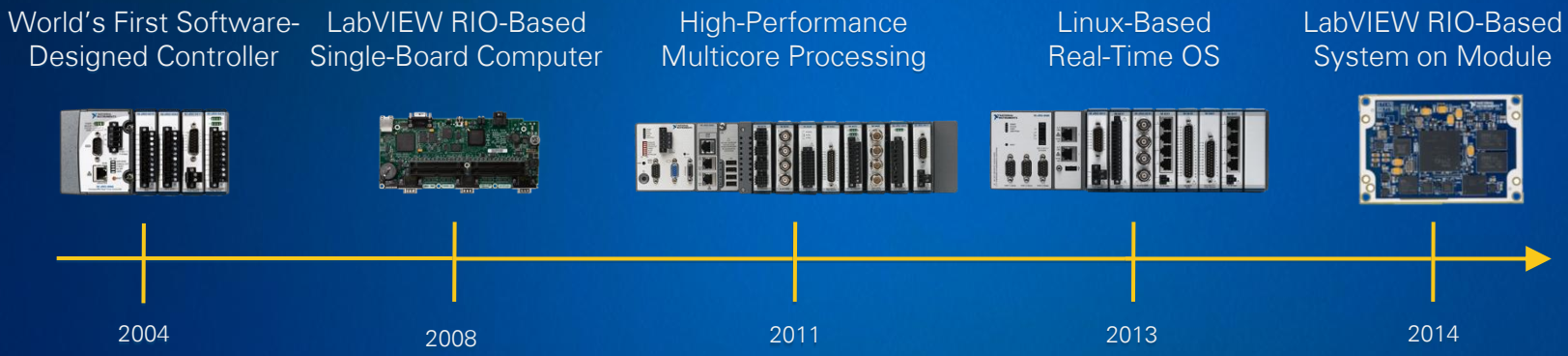
Production Engineer
Fastest test time


CH 1
CH 2
CH 3
CH 4
4-Channel DAC
NI 26.5 GHz Signal Analyzer
Box Analyzer

LabVIEW RIO Architecture



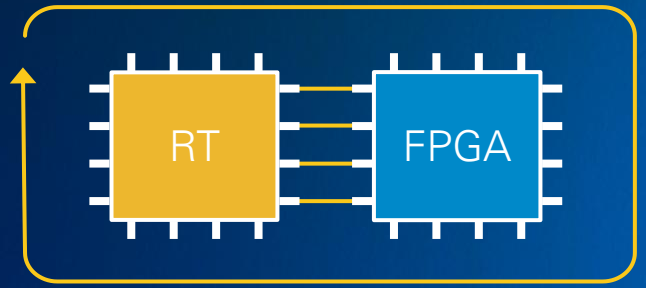
CompactRIO—A Decade of Innovation



Rostislav Halas

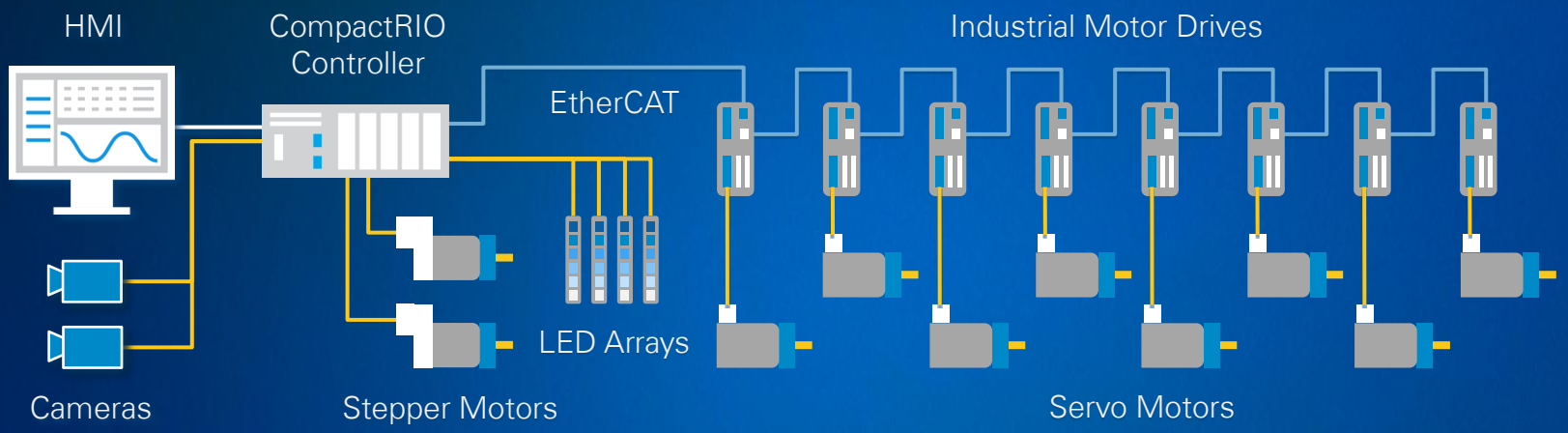
Technical Marketing Engineer

NI

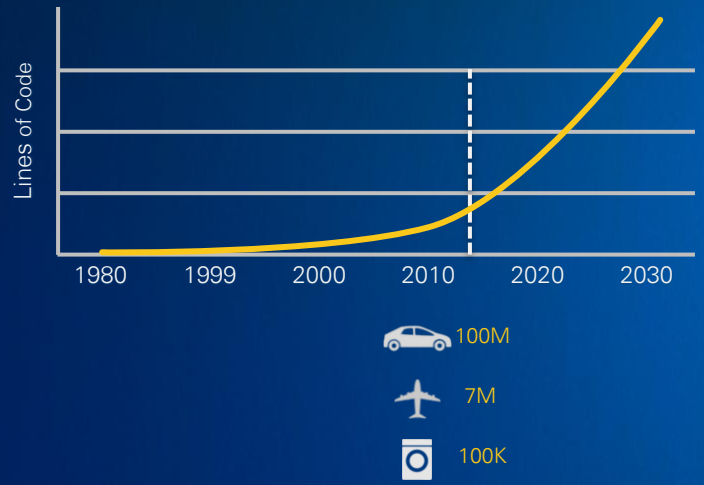


Perform Advanced Control and Analysis

Simplify Your Industrial System

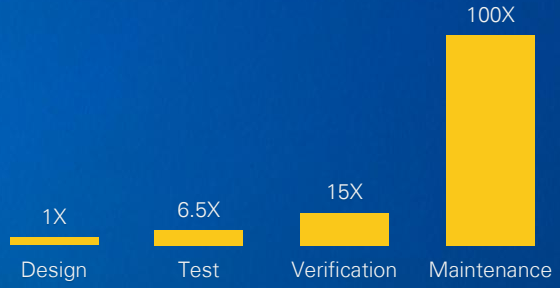

HMI
CompactRIO Controller
Industrial Motor Drives
EtherCAT
LED Arrays
Cameras
Stepper Motors
Servo Motors

Embedded Software Complexity



10–20 defects for every 1,000 lines

Cost per Defect



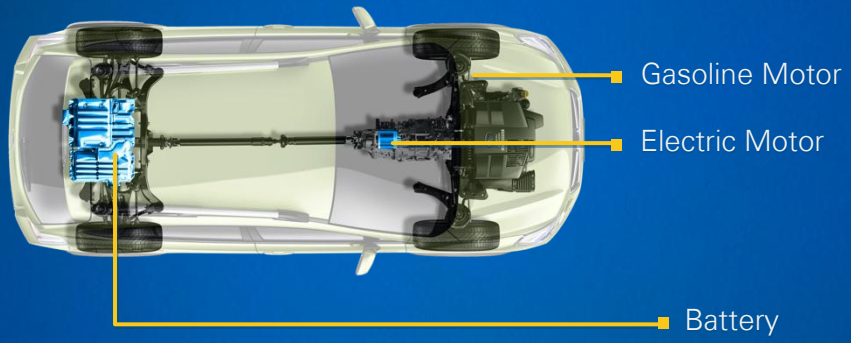
JACOBS®

$11 Billion+
revenue generated in 2013

70,000+
employees worldwide

Expensive Facility Operation
Difficult to Retest
All Data is Critical

14 EE

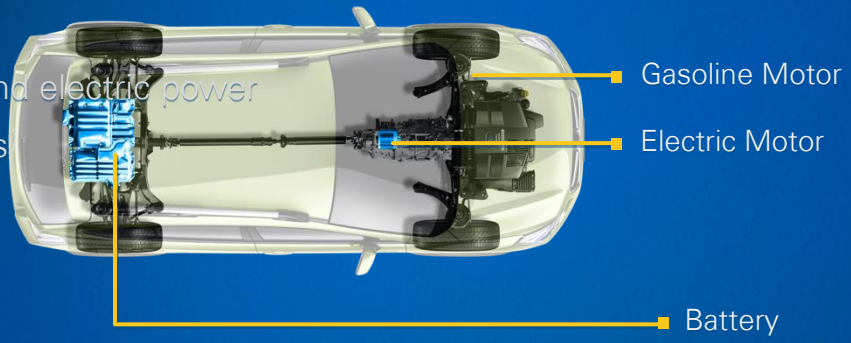

Gasoline Motor
Electric Motor
Battery

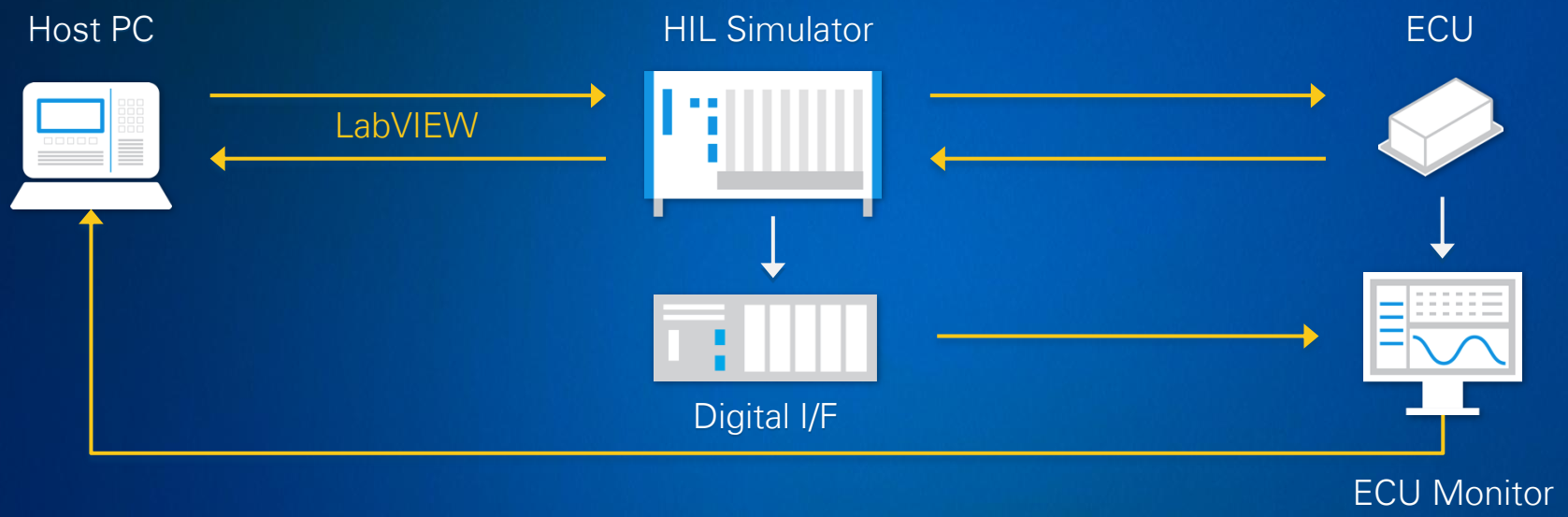
Sophistication of Test

Complex interaction of gasoline and electric power

Microsecond simulation loop rates

Nonlinear models




Host PC
HIL Simulator
ECU
LabVIEW
Digital I/F
ECU Monitor

LabVIEW FPGA
JMAG Finite-Element Models
FlexRIO FPGA + DRAM
Better Test Coverage
Automated Testing
20X Reduction in Test Time

High Voltage and Current Modules

Synchrophasors and Harmonic Disturbances

Industrial Communication Protocols

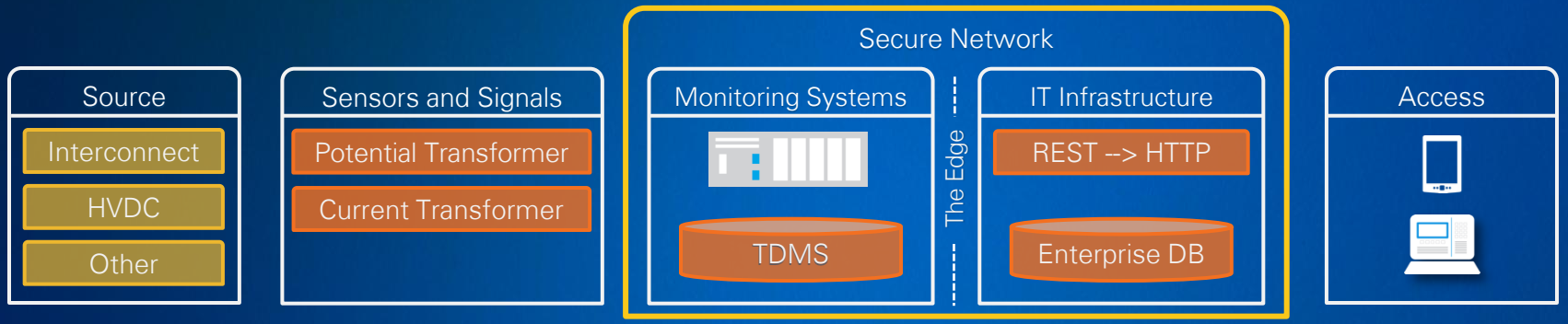
nationalgrid

Requirements of Future Grid Instrumentation

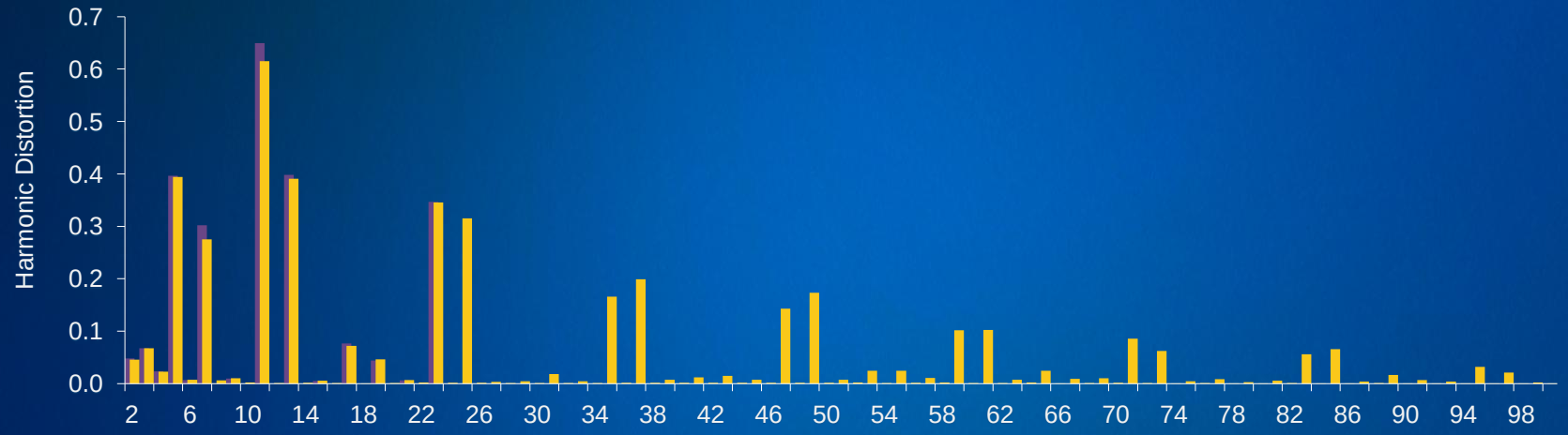
Access to Data

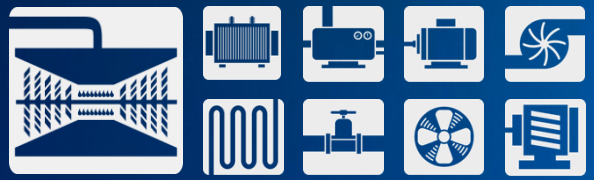
Flexibility

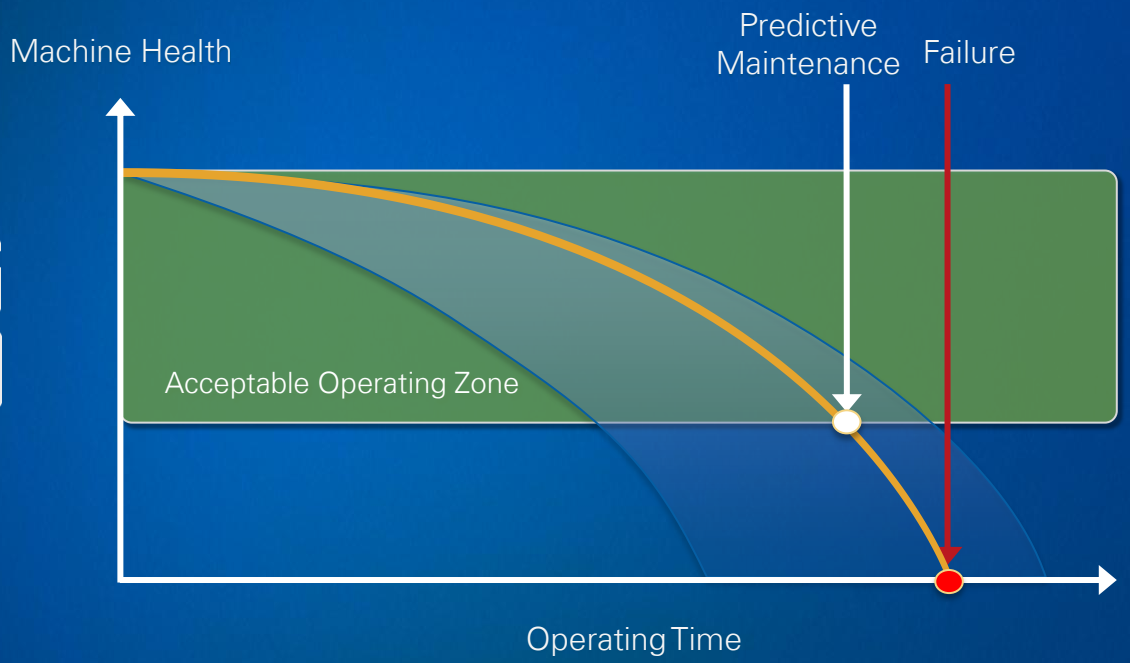
Grid Measurement Capability

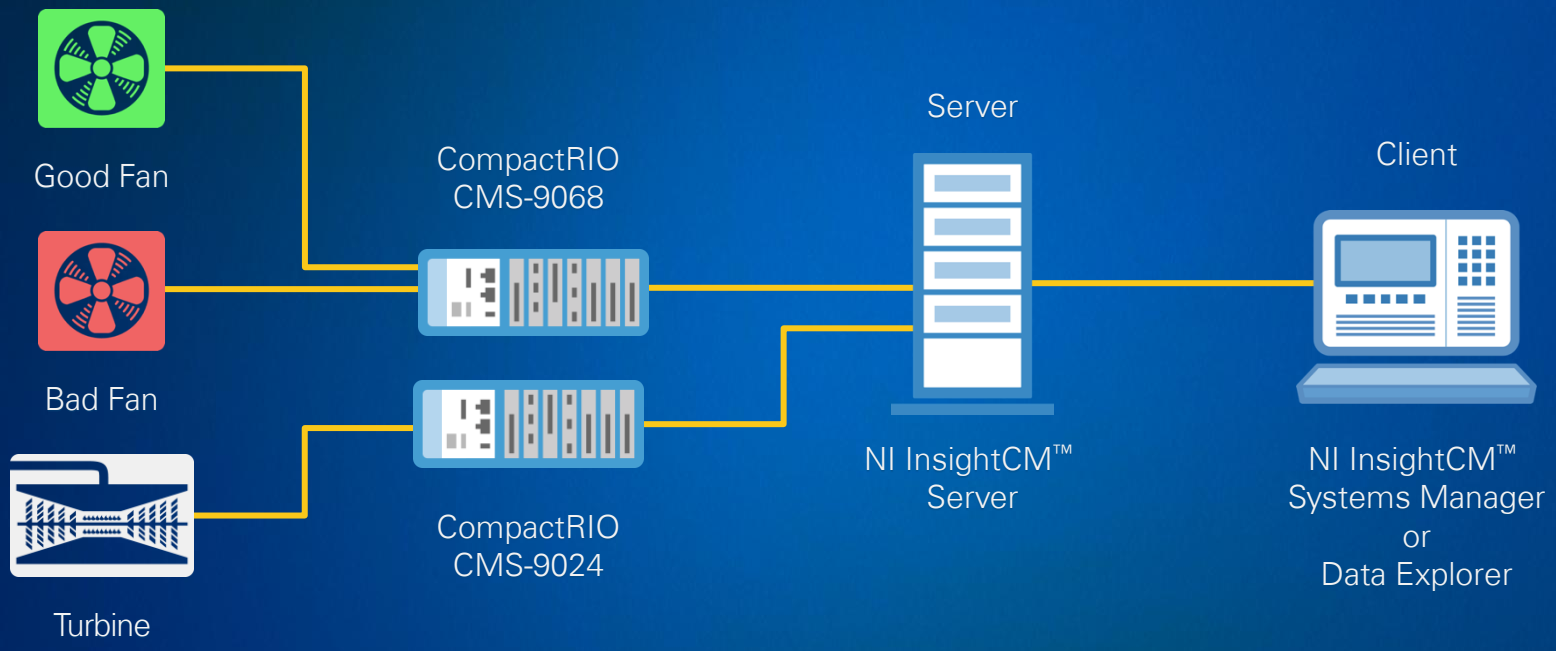

Source
Interconnect
HVDC
Other
Sensors and Signals
Potential Transformer
Current Transformer
Secure Network
Monitoring Systems
TDMS
The Edge
IT Infrastructure
REST --> HTTP
Enterprise DB
Access

Better Grid Measurements With CompactRIO






Machine Health
Predictive Maintenance
Failure
Acceptable Operating Zone
Operating Time


Good Fan
Bad Fan
Turbine
CompactRIO
CMS-9068
CompactRIO
CMS-9024
Server
NI InsightCM™
Server
Client
NI InsightCM™
Systems Manager
or
Data Explorer

NI InsightCM™ Enterprise

- Acquire Dynamic and Static Data
- Analyze Waveform Data
- Visualize Raw Data and Results
- Generate and Manage Alarms
- Manage, Mine, and Age Data
- Configure, Monitor, and Deploy Firmware to Nodes
- Authenticate Users and Devices
- Integrate With IT Infrastructure

NIDays

09:00	Tematski uvod - You and NI Are Creating The Internet of Things Andrej Drozg National Instruments Dvorana: Grand hall - ground floor		
10:15	Tehnička stanka/Stanka za kavu		
	Slijed 1. Dvorana: Grand Hall		Slijed 2. Dvorana: Premium I-II-III.
10:45	Novi softverski oblikovani instrumenti za automatizirano ispitivanje Damjan Drozg National Instruments	10:45	Temperaturno i vibracijsko („Shake & Bake“) ispitivanje „Mobile Base Control Unit - MBCU“ elektroničkih uređaja korištenih u robotskim strojevima za razminiranje/vatrogastvo, upotrebom CompactDAQ hardvera i LabVIEW softvera Krešimir Hercigonja DOK-ING Ltd.
		11:10	Prijenosni autonomni logeri i resenja za vizualnu inspekciju Mitja Gliha Versarum
11:35	Prikaz najnovijih programabilnih automacijskih kontrolera s otvorenim operativnim softverom Andrej Drozg National Instruments	11:35	Unaprijedite mogućnosti vaših DAQ aplikacija R serijom Andrej Korošec National Instruments
12:15	Ručak		

13:15	Tematski uvod - You and NI Will Solve the Engineering Grand Challenges Andrej Drozg National Instruments Dvorana: Grand hall - ground floor		
14:00	Tehnička stanka		
14:15	Automatsko upravljanje strojem za etiketiranje; optička inspekcija etiketa i naljepnica; statistika rada i izvještaji Ivan Pankretić Asemo d.o.o.	14:15	Radionica: Nastava NI myRIO u ugrađenim sustavima ili Radionica: LabVIEW u prikupljanju podataka i DIAdem za offline obradu signala Damjan Drozg, Andrej Korošec National Instruments
14:40	Razvoj sustava regulacije pametnog punjača i upravljanja tokovima energije za baterije i ultrakondenzatore Mario Hrgetić Sveučilište u Zagrebu		
15:05	Sustav za mjerenje toplinske vodljivosti praškastih materijala nestacionarnim osjetilom zasnovanim na tehnici "vruće žice". Dražen Čavužić TEVA Pharmaceutical Industries, PLIVA Croatia		
15:30	NI VirtualBench - 5 instrumenata u jednom uređaju Rostislav Halaš National Instruments		
15:50	Stanka za kavu		
16:20	Virtualni instrumenti za mjerenje i prikaz elektromiografskog signala koristeći prijenos signala putem ljudskog tijela Ivan Babić Sveučilište u Zagrebu	16:20	Radionica: Nastava NI myRIO u ugrađenim sustavima ili Radionica: LabVIEW u prikupljanju podataka i DIAdem za offline obradu signala Damjan Drozg, Rostislav Halaš National Instruments
16:45	MioDent-elektromiografsko/poligrafski uređaj za dentalne aplikacije Velimir Išgum Fakultet elektrotehnike i računarstva - FER		
17:10	Ispit za "Certified LabVIEW Associate Developer" (CLAD)		

Thank you!

Where to go next?

- Get additional resources on LabVIEW
  www.ni.com/labview
- Learn about NI and Data Acquisition
  www.ni.com/daq
- Enroll for a instructor-led LabVIEW class
  www.ni.com/training
- Attend other free seminars and workshops
  http://croatia.ni.com/dogadanja
- Contact our technical consultant and get a free consultation of your project and potential solutions!
  Toll-free number: 06 80 204 704

Contact us

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