RZ/G LINUX PLATFORM
Press Briefing

RENESAS ELECTRONICS CORPORATION

OCT. 16, 2017

BIG IDEAS
FOR EVERY SPACE

RENESAS

AGENDA

Market dynamics

Challenges for embedded developers

Renesas' solution – RZ/G Linux Platform

Supported workflows

Summary

BIG IDEAS FOR EVERY SPACE

RENESAS

MARKET DYNAMICS

BIG IDEAS
FOR EVERY SPACE

RENESAS

MARKET TRENDS

- In the industrial market, network and multimedia functions - including movies and graphics - are becoming popular in embedded devices.

- The number of customers who adopt Linux is increasing due to the availability of these functions. Many of these customers are switching to MPUs from an MCUs running an RTOS.

- Industrial customers have conflicting demands – wanting both the latest, greatest kernel which provides new features and security fixes but also a stable kernel for long term operation.

CHALLENGES FOR EMBEDDED DEVELOPERS

BIG IDEAS
FOR EVERY SPACE

RENESAS

CHALLENGES FOR EMBEDDED DEVELOPERS

Industrial equipment continues to evolve

e.g. **Displays for industrial machines**

Past / Current

- Simple function,
- Standalone operation

Current / Future

- Look & feel of advanced tablet
- High-resolution display and graphics
- Embedded video

- Network processing
- Cloud collaboration
- Sensing, AI

More developers are looking to Linux

BIG IDEAS FOR EVERY SPACE

RENESAS

BARRIERS TO LINUX UTILIZATION

Linux provides a rich set of software functions, but there are barriers to overcome

Entry

- No Linux expertise in the company
- It takes time to acquire skills
- Creating a Linux environment is a serious endeavor

Development

- Anxiety about open source verification process
- Middleware introduction can cause issues w/ kernel versions

Maintenance

- "I thought it was free, but I needed people for administration and maintenance"
- "Free" quickly becomes expensive!
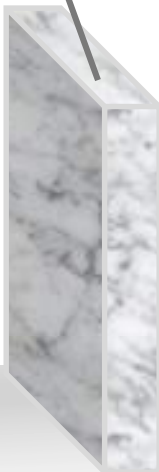
Harnessing the power of Linux in your products!

RENESAS

EMBEDDED LINUX SUPPORT & MAINTENANCE ISSUES
LINUX KERNEL SUPPORT PERIOD IS COMMONLY 2-3 YEARS

Linux maintenance is no longer than 2-3 years

Long term support community for embedded systems

LONG TERM SUPPORT INITIATIVE

LTSI (Long Term Support Initiative) is a community that maintains Linux kernel for embedded equipment

How long does customer need for development, installation, operation, and maintenance?

Industrial equipment (HMI)
develop/install : 3-4 years
operate/maintain : > 10years

Building control (HVAC, monitoring)
develop/install : 2-3 years
operate/maintain : > 10 years

"The kernel maintenance period will end during our development cycle!!!"

"Looks like we will need to do maintain this ourselves after all…"

BIG IDEAS FOR EVERY SPACE

RENESAS

RENESAS' SOLUTION

BIG IDEAS
FOR EVERY SPACE

RENESAS

RZ/G LINUX PLATFORM

BIG IDEAS FOR EVERY SPACE

RENESAS

FEATURING SUPER LONG-TERM LINUX SUPPORT

Super Long Term Support Linux Package
over 10 years

Founded in 2016

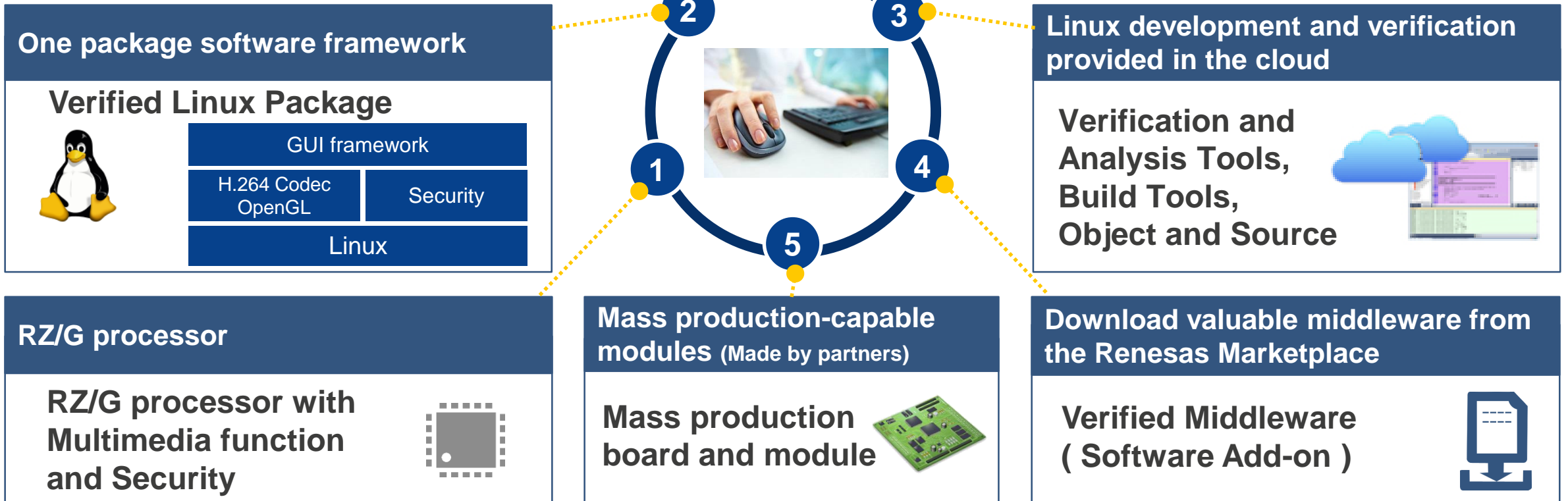■ **CIP** (**C**ivil **I**nfrastructure **P**latform) Project

- Industrial Grade Linux
- Super Long-term Support（SLTS：10 〜 15 year）
- Reliability / Security / Real-Time Support
- Selected Main kernel from LTS/LTSI Kernel by 3-5 year

- Renesas joined CIP Linux project as a platinum member (February 2017)

- RZ/G board will be adopted as a standard board of CIP project

- In addition to Linux kernel, industrial & IoT functions were packaged as RZ/G Linux Platform

RZ/G LINUX PLATFORM
5 COMPONENTS THAT FACILITATE LINUX INTRODUCTION, DEVELOPMENT, AND COST REDUCTION

RZ/G Linux Platform

One package software framework

Verified Linux Package

GUI framework	
H.264 Codec OpenGL	Security
Linux	

RZ/G processor

RZ/G processor with Multimedia function and Security

Linux development and verification provided in the cloud

Verification and Analysis Tools, Build Tools, Object and Source

Mass production-capable modules (Made by partners)

Mass production board and module

Download valuable middleware from the Renesas Marketplace

Verified Middleware (Software Add-on)
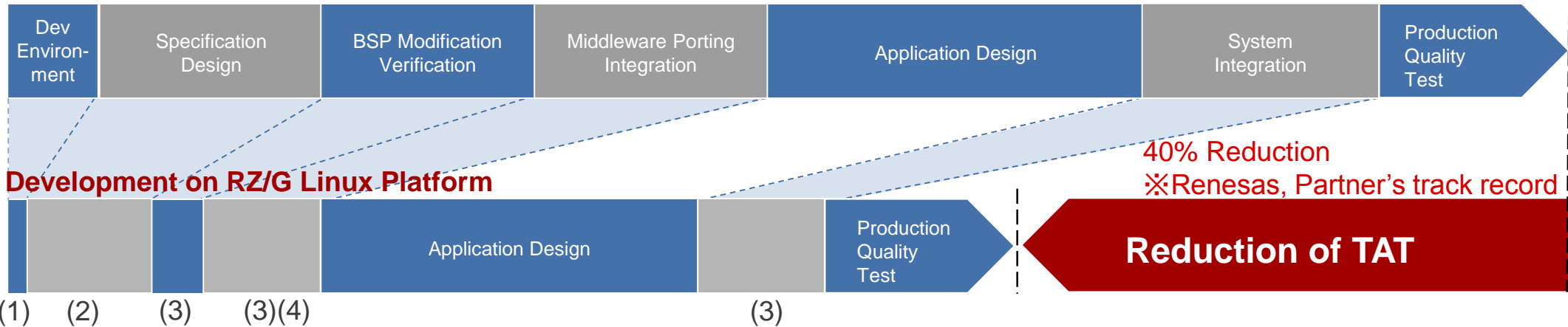
BIG IDEAS FOR EVERY SPACE

RENESAS

BENEFITS OF RZ/G LINUX PLATFORM (1)
REDUCED TURN-AROUND TIME (TAT)

RZ/G Linux platform makes it easy to start Linux development and reduce total cost.
The time you save can be better spent developing value-added services and fostering innovation.

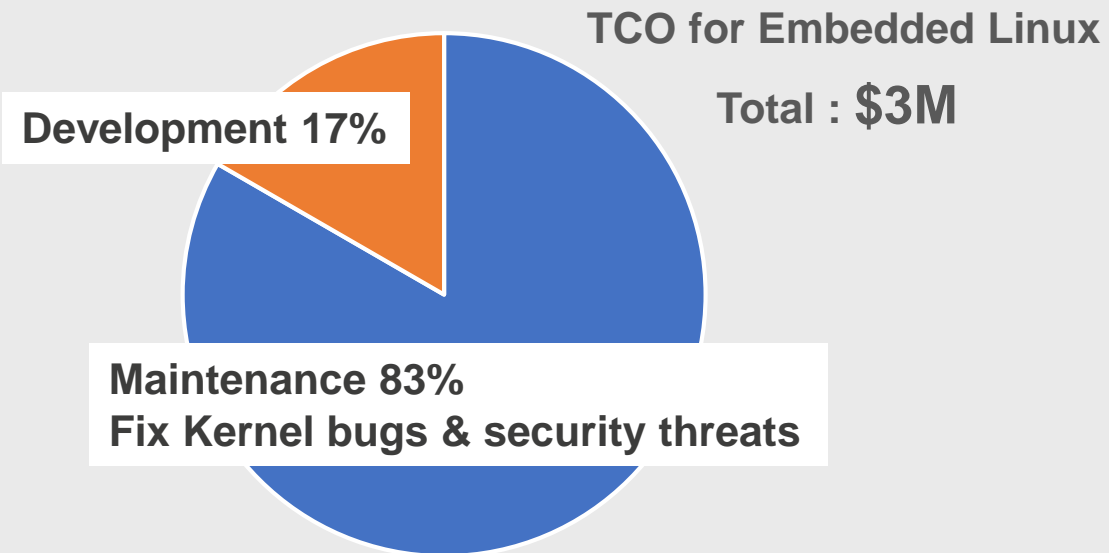**Development on previous Embedded Linux**

| Dev Environ-ment | Specification Design | BSP Modification Verification | Middleware Porting Integration | Application Design | System Integration | Production Quality Test |

Development on RZ/G Linux Platform

| | | | | Application Design | | Production Quality Test |

40% Reduction
※Renesas, Partner's track record

Reduction of TAT

(1)   (2)   (3)   (3)(4)   (3)

(1)	Cloud environment	Linux server - no need to set up the environment
(2)	Verified Linux package	No need for OSS procurement - start from a stable framework, and maintain
(3)	Build, verify and analyze tools	Increase debugging efficiency
(4)	Software add-on	Reduce challenge of function implementation, shorten Software verification period

BENEFITS OF RZ/G LINUX PLATFORM (2)
REDUCED TOTAL COST OF OWNERSHIP (TOC)

Current Lifecycle Cost

Case : HMI with Internet/Intranet

TCO for Embedded Linux

Total : $3M

Development 17%

Maintenance 83%
Fix Kernel bugs & security threats

An in-company investigation

New RZ/G Linux Platform

Can reduce total cost by 80%

Thanks to more than 10-year maintenance, stability, reliability and industrial specific features

Fix Kernel bugs & Security Threats by backporting from Latest Linux

BIG IDEAS FOR EVERY SPACE

RENESAS

RZ/G LINUX PLATFORM
COMPONENT #1 - THE RZ/G PROCESSOR

RZ/G Linux Platform

One package software framework

Verified Linux Package

GUI framework	
H.264 Codec OpenGL	Security
Linux	

Linux development and verification provided in the cloud

Verification and Analysis Tools, Build Tools, Object and Source

RZ/G processor
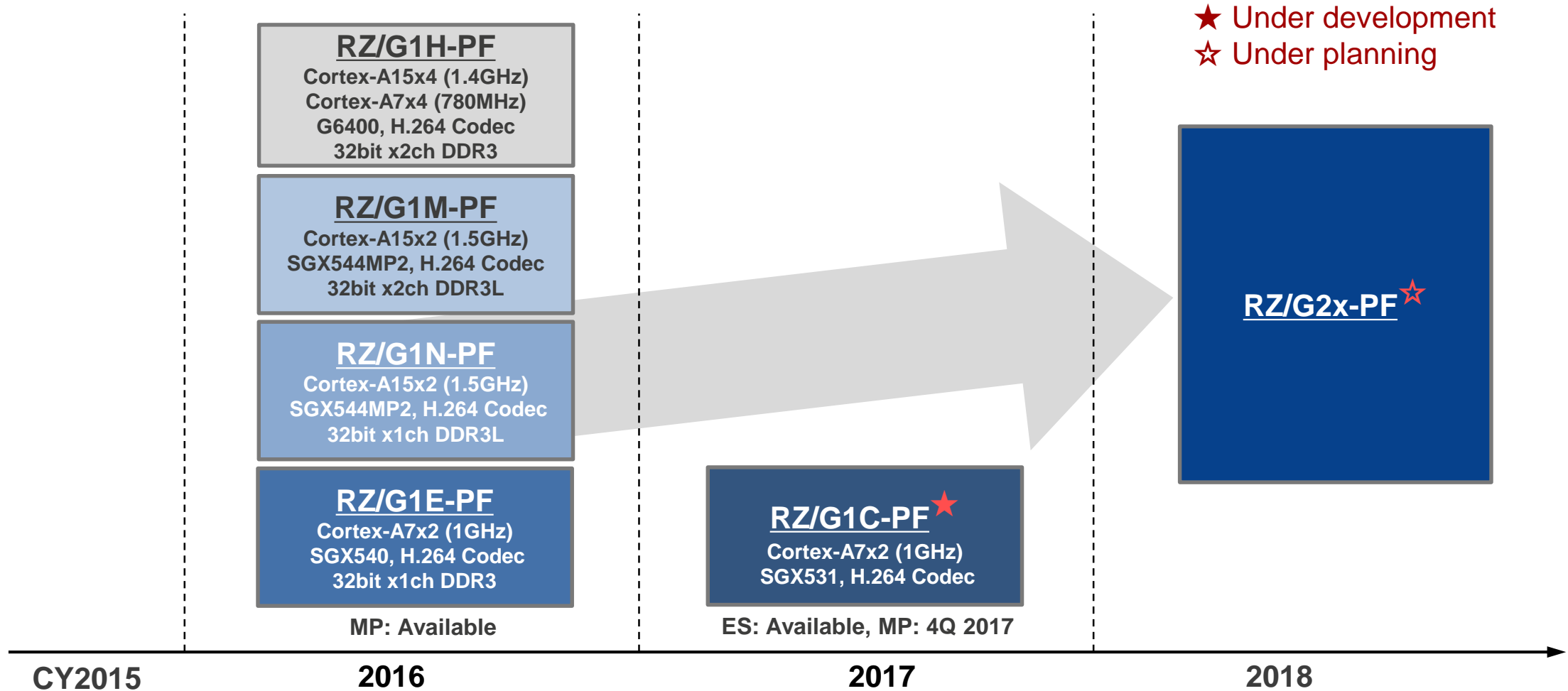
RZ/G processor with Multimedia function and Security

Mass production-capable modules (Made by partners)

Mass production board and module

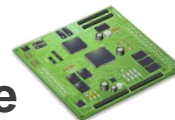### Download valuable middleware from the Renesas Marketplace

Verified Middleware (Software Add-on)

RZ/G-PF (PLATFORM) SERIES MPU ROADMAP
ENTIRE PRODUCT LINE-UP INCLUDES SECURITY FEATURES

★ Under development
☆ Under planning

RZ/G1H-PF
Cortex-A15x4 (1.4GHz)
Cortex-A7x4 (780MHz)
G6400, H.264 Codec
32bit x2ch DDR3

RZ/G1M-PF
Cortex-A15x2 (1.5GHz)
SGX544MP2, H.264 Codec
32bit x2ch DDR3L

RZ/G1N-PF
Cortex-A15x2 (1.5GHz)
SGX544MP2, H.264 Codec
32bit x1ch DDR3L

RZ/G1E-PF
Cortex-A7x2 (1GHz)
SGX540, H.264 Codec
32bit x1ch DDR3

MP: Available

RZ/G1C-PF★
Cortex-A7x2 (1GHz)
SGX531, H.264 Codec

ES: Available, MP: 4Q 2017

RZ/G2x-PF☆

| CY2015 | 2016 | 2017 | 2018 |

RZ/G LINUX PLATFORM DEVICES

In addition to operations such as multimedia processing and advanced graphics processing, enhanced performance is achieved through various software add-ons

1 **Computing power via multiple GHz+ CPUs**

2 **Built-in video engine compatible with full HD**

3 **Built-in 3D graphics engine**

4 **Built-in high-speed interface** (USB3.0, SATA, PCI-e)

5 **Security** (secure communication, data protection, program protection)

BIG IDEAS FOR EVERY SPACE

RENESAS

RZ/G LINUX PLATFORM

COMPONENT #2 - ONE PACKAGE SOFTWARE FRAMEWORK

RZ/G Linux Platform

Linux CIP Kernel, HTML5 GUI, Security Support

One package software framework
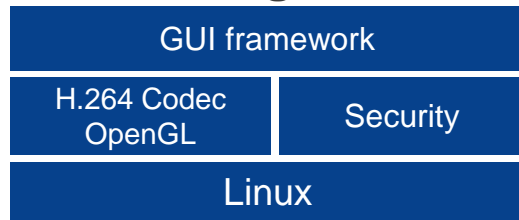
Verified Linux Package

GUI framework	
H.264 Codec OpenGL	Security
Linux	

2

3

1

4

5

Linux development and verification provided in the cloud

Verification and Analysis Tools, Build Tools, Object and Source

RZ/G processor

RZ/G processor with Multimedia function and Security

Mass production-capable modules (Made by partners)

Mass production board and module

Download valuable middleware from the Renesas Marketplace

Verified Middleware (Software Add-on)

BIG IDEAS FOR EVERY SPACE

RENESAS

VERIFIED LINUX PACKAGE
VERIFICATION AND MAINTENANCE PROVIDED BY RENESAS

Conventional Linux is not "industrial-grade" with deep & systematic maintenance needed for mass production. Renesas' **Verified Linux Package** is tested and maintained **Industrial Grade Linux**.

Verified Linux Package

(Deliverables)

Application

API Verification

GUI Framework (Qt/HTML5)

Linux (Stacks /Libraries)

Gstreamer

OpenGL

H.264 Codec GFX

Secure Middle Ware

SW Add-on

Linux kernel

BSP

Renesas RZ/G Eva. Board
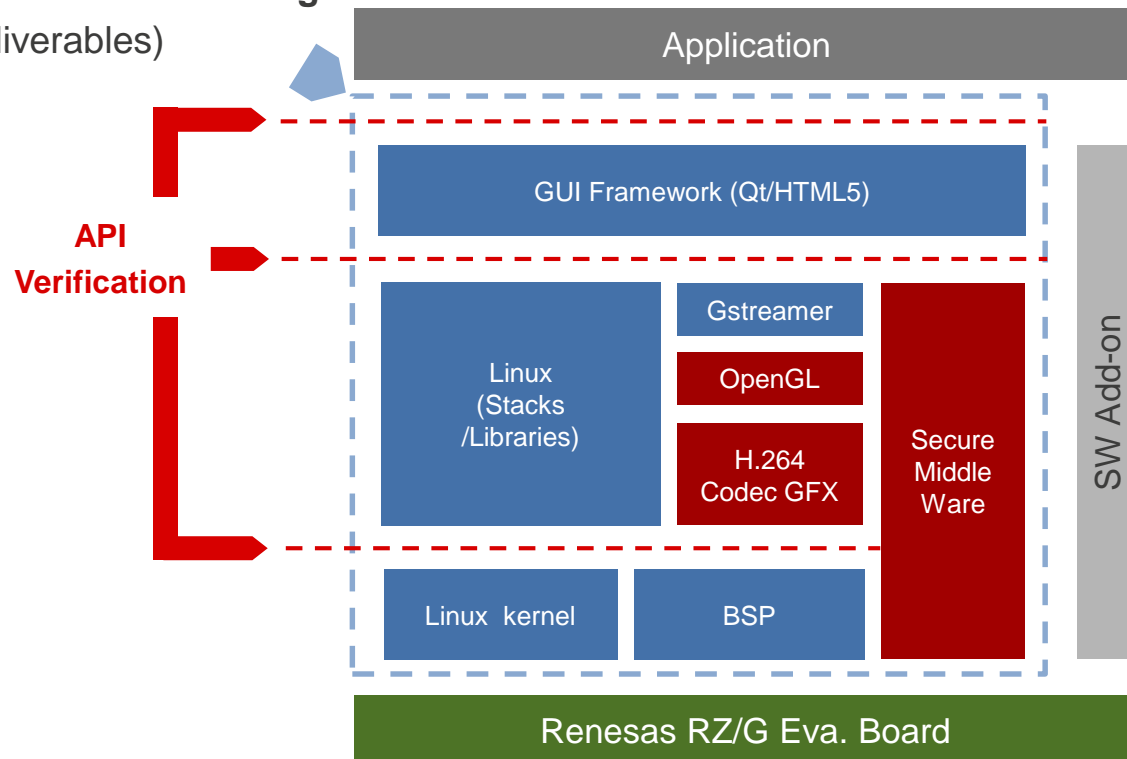
Quality Control for Verified Linux Package

- Software development process managed by CMMI Level3

Operation Verification

- API level verification checklist defined and documented
- Test cases and test reports are also provided

Maintenance

- Q&A Support
- Maintenance and update of Verified Linux Package

BIG IDEAS FOR EVERY SPACE

RENESAS

VERIFIED LINUX PACKAGE INTEGRATED WITH HMI FEATURES

Enables a quick-start to Linux development, thanks to a robust out-of-box software framework. Includes GUI, graphics, and multimedia framework plus pre-built security package.
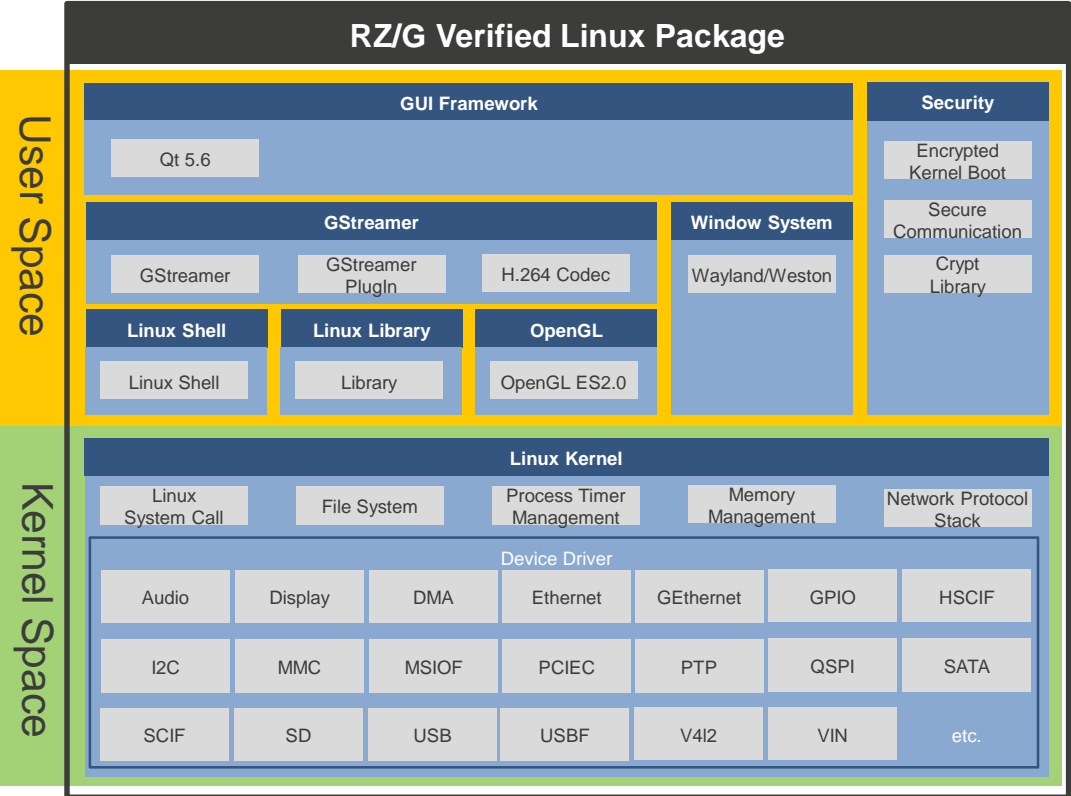
Multimedia
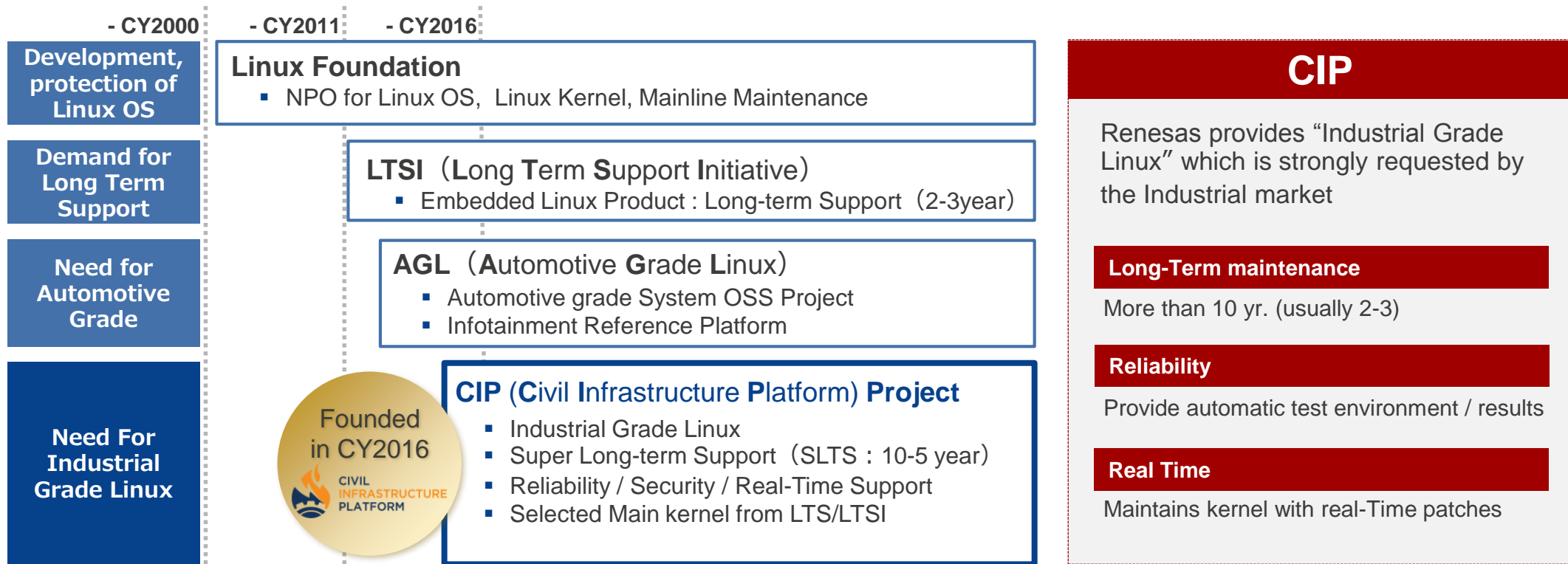
H.264 codec, 3D graphics

GUI framework

Qt application framework

Security

Secure communication
Data / program protection

WHAT IS CIP LINUX?

The CIP project is an initiative to develop and maintain an Industrial Grade Linux Kernel.
It was launched as collaborative project of the Linux Foundation in 2016.

- CY2000   - CY2011   - CY2016

Development, protection of Linux OS

Linux Foundation
- NPO for Linux OS, Linux Kernel, Mainline Maintenance

Demand for Long Term Support

LTSI (**L**ong **T**erm **S**upport **I**nitiative)
- Embedded Linux Product : Long-term Support (2-3year)

Need for Automotive Grade

AGL (**A**utomotive **G**rade **L**inux)
- Automotive grade System OSS Project
- Infotainment Reference Platform

Need For Industrial Grade Linux

Founded in CY2016
CIVIL INFRASTRUCTURE PLATFORM

CIP (**C**ivil **I**nfrastructure **P**latform) **Project**
- Industrial Grade Linux
- Super Long-term Support (SLTS : 10-5 year)
- Reliability / Security / Real-Time Support
- Selected Main kernel from LTS/LTSI

CIP

Renesas provides "Industrial Grade Linux" which is strongly requested by the Industrial market

Long-Term maintenance

More than 10 yr. (usually 2-3)

Reliability

Provide automatic test environment / results

Real Time

Maintains kernel with real-Time patches

Renesas continues its legacy in Linux, with the CIP kernel

BIG IDEAS FOR EVERY SPACE

RENESAS

WHAT IS HTML5?

'Mozilla community' 'Gecko' rendering engine ported to RZ/G

➤ High-performance image processing on RZ/G GPU

Leverages latest web development technology

➤ Easy to develop intuitive touch-panel GUI

HTML5 is available as a GUI framework for RZ/G

Example of Demo contents

Swipe screen transition

Smooth screen display effect
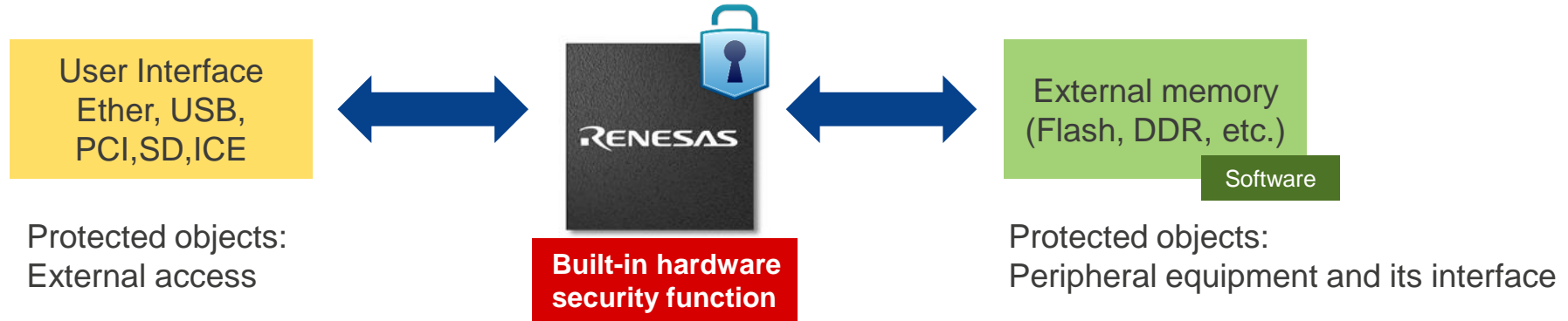
Graphic drawing animation display

Movie playback using GPU
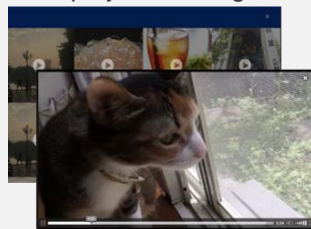
HTML5

- Adopted Gecko engine installed in Firefox

- Free-of-charge, maintained by Mozilla

- Numerous HTML5 applications prepared

- No reboot required to update applications

RENESAS

RZ/G SECURITY SOLUTION

Provides security solution to protect product physical data and software

User Interface Ether, USB, PCI,SD,ICE	⟷	RENESAS **Built-in hardware security function**	⟷	External memory (Flash, DDR, etc.) Software
Protected objects: External access				Protected objects: Peripheral equipment and its interface

Security function using Trusted Secure IP with built-in RZ/G		Security effect
Software tamper detection / authentication	Encrypted kernel boot function (tampering judgment at startup). Update mechanism for software linked with cloud server.	Tamper detection by software authentication / prevention (protection)
Encrypted communication	Function for SSL / TLS protocol communication. Utilize Secure IP to protect keys for authentication and to establish secure communication path.	Communication protection
Storage protection	Data protection function secured in products. Data encryption/decryption with Secure IP unique key.	Data protection

 BIG IDEAS FOR EVERY SPACE RENESAS

RZ/G SOFTWARE DELIVERABLES FOR SECURITY SOLUTION

Security solutions are provided with the Renesas' Verified Linux Package

Verified Linux Package

- Linux
  - Application
  - Security Solution M/W
  - Security Driver

- Boot Loader
  - Encrypted Kernel Loader
  - Security Driver

- RZ/G
  - Hardware Function（Trusted Secure IP）

Definition	Contents

Security Driver	Driver software for Trusted Secure IP (TSIP)
	▪ For Encrypted Kernel boot
	▪ For Encrypted Communication (SSL/TLS)
	▪ Basic encryption for secure storage
	
	[AES CBC (128bits, 256bits), RSA (1024bits, 2048bits)
	  SHA-1, SHA-256, HMAC (SHA-1, SHA-256)
	  CMAC (AES-128, AES-256)]

Encrypted Kernel Loader	Loader software for Encrypted Kernel Boot

Security M/W	Middleware that provides security functions
	▪ TLS v1.2 (SSL/TLS)
	  cipher suite : TLS_RSA_WITH_AES_128_CBC_SHA256
	▪ Secure Storage
	  Function of encryption/decryption by IP unique key

BIG IDEAS FOR EVERY SPACE

RENESAS

RZ/G LINUX PLATFORM

COMPONENT #3 - LINUX DEVELOPMENT AND VERIFICATION PROVIDED IN THE CLOUD

RZ/G Linux Platform

Enhanced BSP customization
- Build/verification/analysis tools
- Pin configuration tool

One package software framework

Verified Linux Package

GUI framework	
H.264 Codec OpenGL	Security
Linux	

Linux development and verification provided in the cloud

Verification and Analysis Tools, Build Tools, Object and Source

RZ/G processor

RZ/G processor with Multimedia function and Security
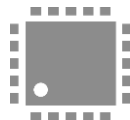
Mass production-capable modules (Made by partners)

Mass production board and module
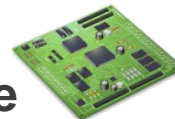
Download valuable middleware from the Renesas Marketplace

Verified Middleware (Software Add-on)

RENESAS
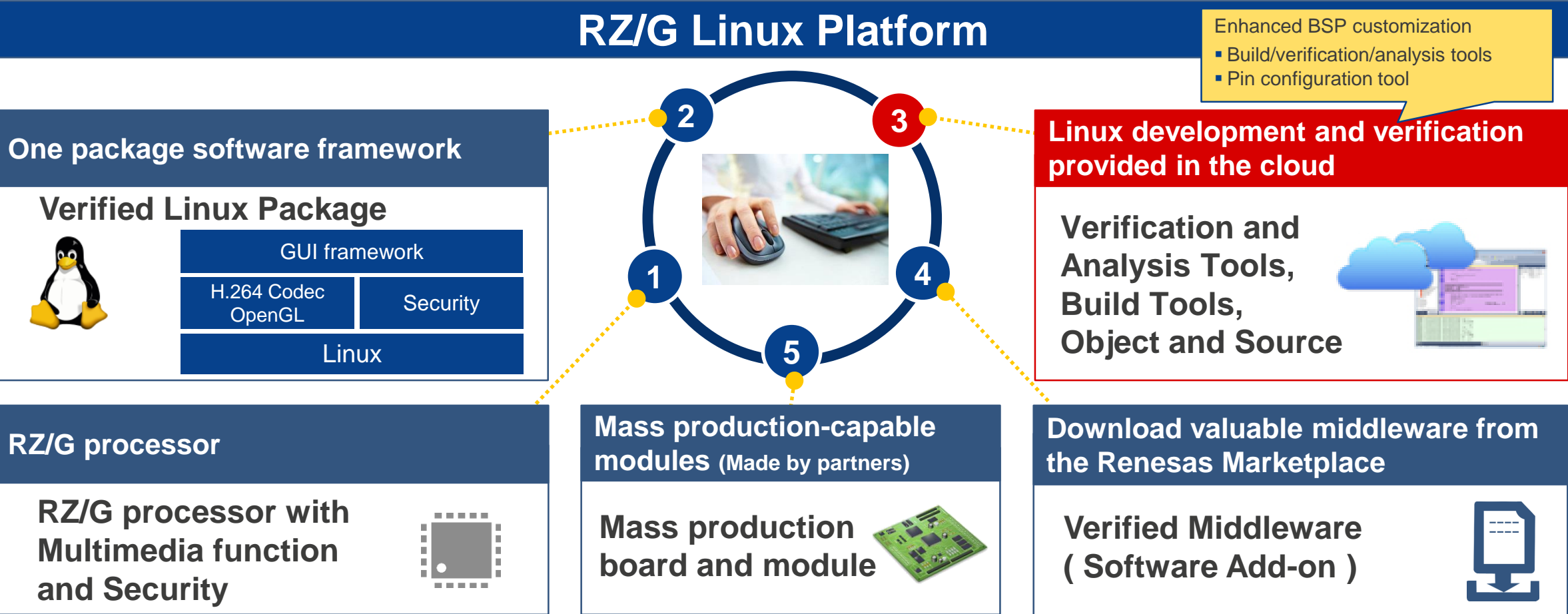
DEVELOPMENT ENVIRONMENT ON THE CLOUD

Management Tools
- User
- Object and Source

Security Tools
- Signature
- Authentication
- Secure Update

Development Tools
- Build
- Verification
- Analysis

Cloud Server

**Renesas RZ/G Board
Customer's Board**

**Client PC
（e2studio）**

Customer Product

BIG IDEAS FOR EVERY SPACE

RENESAS
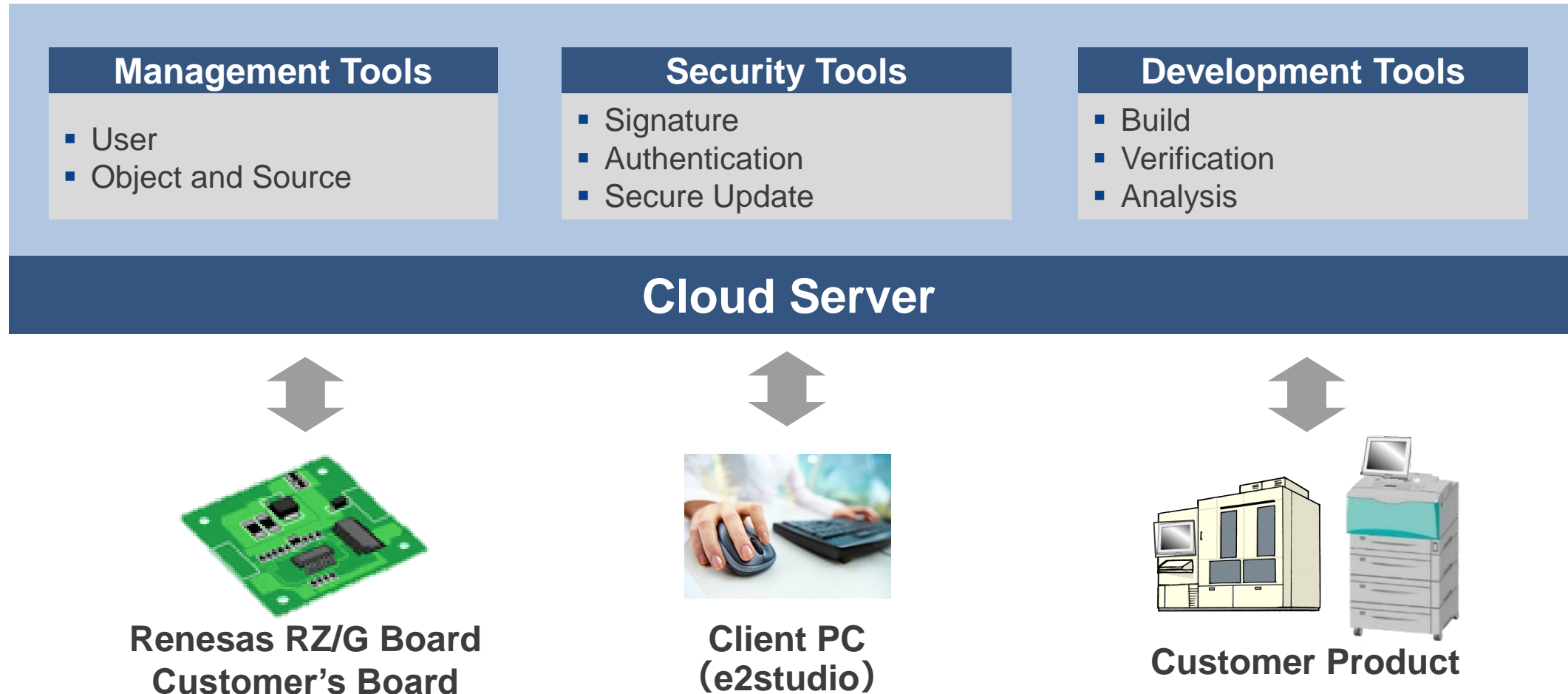
DEVELOPMENT TOOL ON THE CLOUD IMPROVES EFFICIENCY
REDUCE MAN-HOURS FOR LINUX BSP CUSTOMIZATION, SYSTEM VERIFICATION, AND DEBUGGING

Assemble of Customer's Board	Evaluation	Debug	App development

Customer's Board

Verify integrated software on Customer's Board

Debug issue found by verification tools

Develop system

- **Eliminate challenge of creating the build environment, drastically reduce time for application development**

1. Build	Create project in e2studio connected to cloud server; select components and build through GUI.

- **Reduce verification time (TAT) and workload**

2. Verification	Automatically analyze error report from verification tools, leveraging accumulated problem solving cases to guide customers.

- **Shorted analysis time (TAT) and workload**

3. Analysis	Execute verification test patterns from build result to generate detailed error report.

RENESAS

e2studio FOR RZ/G LINUX PLATFORM
AVAILABLE FROM OCTOBER 2017

e2studio = Renesas' Integrated Development Environment (IDE)

- Build and debug Linux applications running on CIP Linux kernel v4.4.55-cip
- Build with Linaro tool chain, GCC Linaro 5.2 - 2015.11 - 2

**RZ/G Linux Platform
Easy installation**

Debugging, memory bus analysis

**Linux Platform
Selecting and building
provided applications**

**Cooperation with cloud
environment
Linux, file system build,
Verification**

**RZ/G terminal setting tool
(Smart Configurator)**

BIG IDEAS FOR EVERY SPACE

DEVELOPMENT SUPPORT TOOLS ON THE CLOUD

Reduction of resources for Linux BSP customization, system test and debug

1. Cloud Build Tool

Eliminate the need for construction and maintenance of a Linux environment
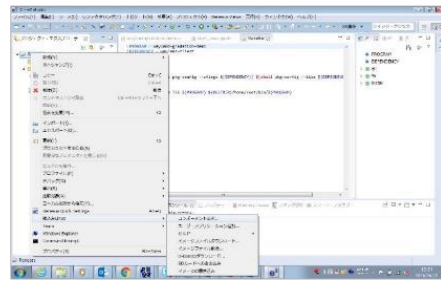
- No need to create a local Linux build server
- Linux development immediately from launch of environment to building BSP on custom boards
- Consistent support during software development

Reduce analysis time (TAT)

3. Analysis tool

- Guide customers to solve the issue by analyzing the error report of the verification tool with the database of Renesas' problem solving know-how

Reduce verification time (TAT)

2. Verification Tool

- Enable to verify customer's development software by verification pattern / program prepared in advance by Renesas
- Possible to add a verification test pattern you created.

BIG IDEAS FOR EVERY SPACE

RENESAS
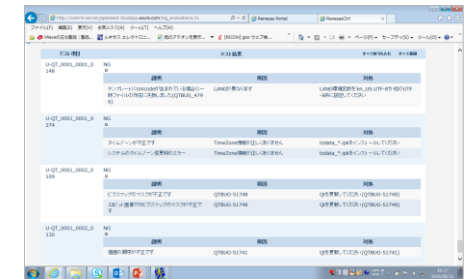
RZ/G LINUX PLATFORM

COMPONENT #4 - DOWNLOAD VALUABLE MIDDLEWARE FROM THE MARKETPLACE

RZ/G Linux Platform

One package software framework

Verified Linux Package

GUI framework	
H.264 Codec OpenGL	Security
Linux	

RZ/G processor

RZ/G processor with Multimedia function and Security

Mass production-capable modules (Made by partners)

Mass production board and module

Linux development and verification provided in the cloud

Verification and Analysis Tools, Build Tools, Object and Source

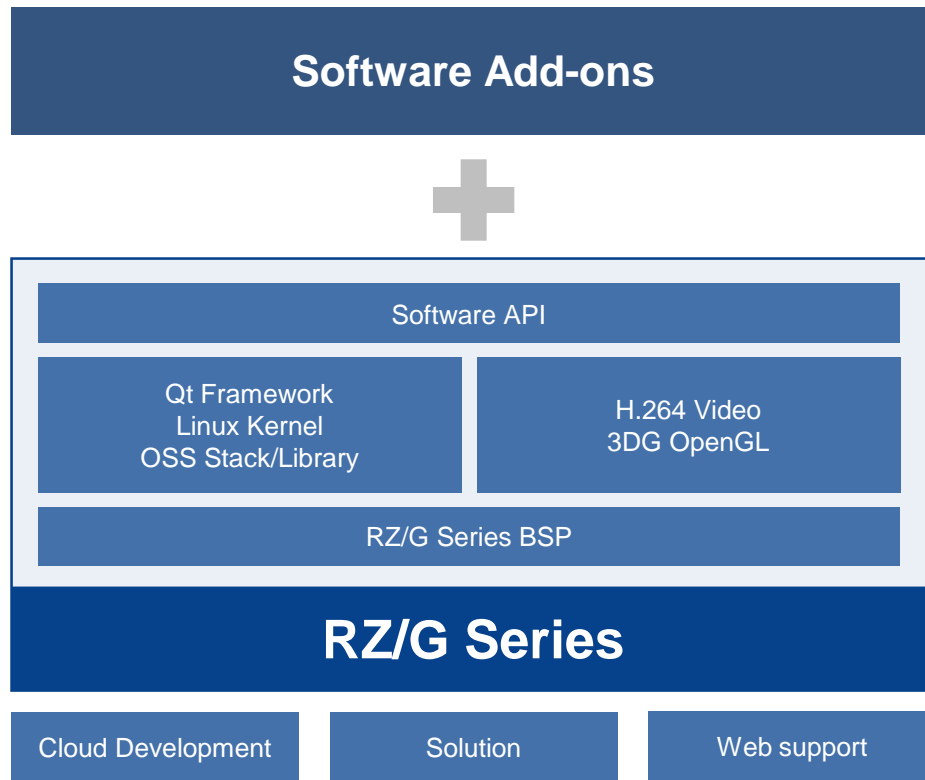### Download valuable middleware from the Renesas Marketplace
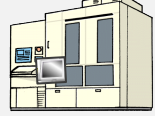
Verified Middleware (Software Add-on)

BIG IDEAS FOR EVERY SPACE

RENESAS

FEATURE ENHANCEMENT VIA VALUABLE SOFTWARE ADD-ONS
E.G. FACE RECOGNITION/AUTHENTICATION, VOICE RECOGNITION/SYNTHESIS, INDUSTRIAL/ CONSUMER PROTOCOLS (FACTORY : ETHERCAT, SURVEILLANCE CAMERA : ONVIF, ETC.)

Verified software add-ons make it easy to enhance the value of customer equipment.

Software Add-ons

+

Software API

| Qt Framework Linux Kernel OSS Stack/Library | H.264 Video 3DG OpenGL |

RZ/G Series BSP

RZ/G Series

| Cloud Development | Solution | Web support |

Plus valuable advanced features

Surveillance
Face Authentication Human Recognition
ONVIF

Industry Panel
EtherCAT

Office Equipment (Printer, etc.)
Deep Learning (Image Recognition)

Door Phone Medical Monitor, HEMS
Security

Secure Update

POS, ATM
Face Authentication

Robot
Voice recognition

Vending Machine Signage
Human Recognition

Building HMI with Camera
Image Distortion Correction

BIG IDEAS FOR EVERY SPACE

RENESAS

MARKETPLACE ACCELERATES NEW PRODUCT DEVELOPMENT

Accelerate new product development and support user's innovation

Customer need:

Accelerate development of new innovative product or service

- New technology installation
- Cross-industry technology installation
- Short-term verification and early software installation

Issue:

It takes a lot of time and work to install new technologies…

- Little development experience and know-how
- Difficult to construct initial verification environment
- No means to collect information

New proposal:

One-stop solution
For industrial market

- Many partner companies
- Safe and secure environment
- Behavior-verified solutions

Renesas Market Place for industrial market

BIG IDEAS FOR EVERY SPACE

RENESAS

ONE-STOP SHOP
EVERYTHING YOU NEED IS AVAILABLE THROUGH THE ONLINE RENESAS MARKETPLACE

Marketplace web site connects customers and ecosystem partners

Buy

Study

Renesas Marketplace

Congregate

Try

Search

Market Place

RENESAS

Expanding ecosystem partners

Buy	Software, Board, Tool	**Pay**	Purchase Shipment	**Dev**	Community / FAQ Latest Information

MARKETPLACE PROMOTES INNOVATION
PROVIDES POC (PROOF OF CONCEPT) DESIGNS FOR NEW TECHNOLOGIES & SERVICES

Partner middleware examples

- Face Authentication
- Deep Learning
- ONVIF
- EtherCAT
- Authentication
- OTA
- Certification
- Failure Detection (Security)
- Quick Boot

RENESAS

Marketplace

Pay Purchase Shipment

Dev Community / FAQ Latest Information

Super Long Term Support Linux

CIP Community
Civil Infrastructure Platform

Unified PoC (Free Trial)
- **Solution example**

HMI + Surveillance camera
- Face Authentication
- Deep Learning
- ONVIF

Security including operation
- Failure Detection (Security)
- Authentication
- OTA
- Certification

BIG IDEAS FOR EVERY SPACE

RENESAS

RZ/G LINUX PLATFORM
COMPONENT #5 - MASS PRODUCTION-CAPABLE MODULES (BY PARTNERS)

RZ/G Linux Platform

One package software framework

Verified Linux Package

GUI framework	
H.264 Codec OpenGL	Security
Linux	

Linux development and verification provided in the cloud

Verification and Analysis Tools, Build Tools, Object and Source

RZ/G processor

RZ/G processor with Multimedia function and Security

Mass production-capable modules (Made by partners)

Mass production board and module

Download valuable middleware from the Renesas Marketplace

Verified Middleware (Software Add-on)

BIG IDEAS FOR EVERY SPACE

RENESAS

PARTNER MP-READY BOARDS
e.g. iWAVE SYSTEMS TECHNOLOGIES

RZ/G1H-PF Q7 SOM

RZ/G1E-PF SODIMM

67.6mm x 37mm
SODIMM Size Compact SOM

RZ/G1x-PF Q7 Development Kit

RZ/G1C-PF Single board computer

85.6mm x 56.5mm

RZ/G1E-PF SODIMM Development Kit
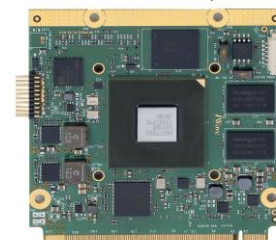
RZ/G1M-PF Q7 SOM

RZ/G1N-PF Q7 SOM

70mm x 70mm Q7 SOM

BIG IDEAS FOR EVERY SPACE

RENESAS

PARTNER MP-READY BOARD STATUS

Manufacturer	LSI	Feature	Schedule	Region
iWave	RZ/G1H-PF	Q7 SOM (70mmx70mm)	Started	W/W
	RZ/G1M-PF RZ/G1N-PF	Q7 SOM (70mmx70mm)	Started	W/W
	RZ/G1E-PF	SODIMM (Smaller than Q7) (37mmx67.6mm)	Started	W/W
	RZ/G1C-PF	Single Board Computer(SBC) (85.6mmx56.5mm)	Started	W/W
Algo System(JP)	RZ/G1E-PF	Panel PC Engineering Service	Under development	Japan
Alpha Project(JP)	RZ/G1E-PF	Single Board Computer(SBC)	Under development	Japan
Silicon Linux(JP)	RZ/G1E-PF	Single Board Computer(SBC)	Started	Japan

BIG IDEAS FOR EVERY SPACE

RENESAS

SUPPORTED WORKFLOWS

BIG IDEAS FOR EVERY SPACE

RENESAS

RZ/G LINUX PLATFORM IS FOR ALL LEVELS OF USERS

Workflow A

Quick and Easy Start

- **Design with cloud-enabled IDE**
- **Use Verification and Analysis tools**
- **Leverage Verified Linux Package**

Goal

Quickest Evaluation and Prototyping!

Workflow B

Accelerate and Optimize

- **Design with "local" cloud-enabled IDE**
- **Use Verification and Analysis Tools**
- **Leverage Verified Linux Package**

Goal

Optimize Efficiency and Quality of your Local Development

Workflow C

Build from Scratch

- **Design on local Linux machine**
- **Build your own Yocto recipes**
- **Leverage Verified Linux Package**

Goal

Build Your own Yocto Distribution on Verified Linux Package

BIG IDEAS FOR EVERY SPACE

RENESAS

QUICK AND EASY START WITH WORK STYLE A

- *No need to build and maintain a Yocto development system on your local machine*
  - *Building a Yocto development system can take several days!*

- *Instead, just use your already familiar e2studio IDE*
  - *The gateway to Renesas' Verified Linux Package (VLP) and cloud-enabled development*

- *Accelerate development and ensure code quality by using Linux Platform Verification and Analysis Tools (Renesas plug-ins to e2studio)*

- *Access a maintained Linux development system with one mouse click*
  - *Maintenance of Verified Linux Platform and tools happens automatically in the cloud*

- *Pull a usable image within just a few minutes for available hardware*

- *Use cloud-enabled development for fastest prototyping*

BIG IDEAS FOR EVERY SPACE

RENESAS

ACCELERATE AND OPTIMIZE WITH WORK STYLE B

- *Get all the benefits of Work Style A, apart from Verified Linux Package (VLP) maintenance*

- *Use all the cloud tools on-premise*

- *Accelerate and optimize your design with one-time Linux platform installation*

BIG IDEAS FOR EVERY SPACE

BUILD FROM SCRATCH WITH WORK STYLE C

- *Get all the benefits of Verified Linux Platform (VLP)*

- *VLP includes a fully integrated Linux CIP based Yocto build environment*

- *Choose your own Yocto recipes and build your own Yocto distribution*

- *Develop your application with integrated application frameworks QT and html5*

BIG IDEAS FOR EVERY SPACE
RENESAS

SUMMARY

BIG IDEAS FOR EVERY SPACE

RENESAS

SUMMARY
RENESAS TAKES THE LEAD WITH INDUSTRIAL GRADE LINUX

1. RZ/G platform silicon provides superior performance and security.

2. Renesas' Verified Linux Package with Super Long-Term CIP Linux dramatically reduces design risk and costs for developers of Industrial embedded systems.

3. Advanced software verification and analysis capabilities plus Linux cloud-build and maintenance helps MCU developers transition to high-end Linux MPU systems.

4. A marketplace of RZ/G solutions connects developers with value-adding software partners.

5. Partner SOMs help customers move from prototype to mass production immediately.

THANK YOU!

BIG IDEAS FOR EVERY SPACE

RENESAS

BIG IDEAS FOR EVERY SPACE

www.renesas.com

RENESAS