R모델을 서비스로 구성하기 위한 몇가지 방안

한석진

한국마이크로소프트

Microsoft

R 모델을 서비스로 구성하기 위한 새로운 방안

한석진 부장
Global Black Belt – AI
Microsoft

Open Source and Microsoft

Windows Server Blog

Microsoft Loves Linux

May 6, 2015

MICROSOFT WINDOWS SERVER TEAM

In a press and analyst briefing a few months back, Microsoft CEO Satya Nadella put up a slide proclaiming "Microsoft ♥ Linux". Wow! What a great slide and what a change for Microsoft! The trade press picked up on this slide in a major way, with a number of articles echoing this new approach to Linux and open source within Microsoft. And they're right!

July 06, 2015

R Consortium News Roundup

In case you missed the news last week, the R Consortium was announced. This new non-profit trade group will work with the R Foundation to support the R Community and the R Project generally.

As you might expect, the announcement generated quite a bit of news in the press. Here are links to some of the coverage:

- Venturebeat: Microsoft, Oracle, HP, Tibco, RStudio form the R Consortium under the Linux Foundation
- Datanami: Consortium Makes Business Case For R Language
- Computerworld: Update: Google, Microsoft, Oracle back new R Consortium at Linux Foundation
- CIO: R Consortium aims to strengthen data analysis
- Infoworld: Open source lives! The R project is the real deal

Founding members of the R Consortium include Microsoft, RStudio, TIBCO, Alteryx, HP, Mango Solutions, Google, Ketchum Trading and Oracle. In addition to the announcement on this blog, many of the founding members had their own announcements:

- Microsoft Technet: Microsoft Joins the R Consortium
- RStudio blog: Accelerating R: RStudio and the new R Consortium
- Mango Solutions press release: Mango Solutions and The R Consortium
- Oracle blog: R Consortium Launched!

I'm sure there will be plenty of more news from the R Consortium to come. Stay tuned!

MICROSOFT | TECH | LINUX

Microsoft really does love Linux

Redmond has truly embraced the open source community

By Tom Warren | @tomwarren | Sep 15, 2016, 4:55am EDT

SHARE

Recent moves include the open sourcing of PowerShell, Visual Studio Code, and Microsoft Edge's JavaScript engine. Microsoft also partnered with Canonical to bring Ubuntu to Windows 10, and acquired Xamarin to aid mobile app development. Microsoft even open sourced Xamarin's SDKs and developer tools, and brought SQL Server to Linux.

MICROSOFT HAS MADE A LOT OF OPEN SOURCE MOVES RECENTLY

Microsoft has been focused on open sourcing software for at least a decade, but it has rapidly increased this work in recent years. While Microsoft will probably never open source Windows or Office, its position on Github proves that it's now a true open source company. That's something you wouldn't have associated with Microsoft 10 years ago. Microsoft has declared its love for Linux before, but like any relationship actions speak louder than words. It's now clear Microsoft *really* does love Linux. We wish them all the happiness in their new life together.

Overview | Programs office

Thousands of Microsoft engineers use, contribute to and release open source every day across every platform, from the cloud to client operating systems, programming languages and more.

Popular projects include Visual Studio Code, TypeScript, and .NET. Microsoft's open source code is released under Open Source Initiative-approved licenses such as MIT and Apache 2.0.

Explore Microsoft open source

Community resources

Discover Microsoft-released open source

At opensource.microsoft.com you can explore open source that Microsoft teams have released and are collaborating with the broader community of software engineers. Microsoft's open source repositories live on GitHub.

Browse opensource.microsoft.com

Microsoft Open Source Code of Conduct

The Microsoft Open Source Code of Conduct outlines expectations for participation in Microsoft-managed open source communities, as well as steps for reporting unacceptable behavior.

Microsoft Open Source Code of Conduct

Microsoft Contributor License Agreements

We appreciate community contributions to code repositories governed by Microsoft. By signing a contribution license agreement, we ensure that the community is free to use your contributions.

Microsoft contributor license agreement

Third-party disclosures

An archive of notices and source code for certain third-party components shipped with Microsoft products, in accordance with the corresponding licenses that contain disclosure obligations.

Review notices and archives

Microsoft + Open Source

September 26, 2017

Standards

We are pleased to announce that Microsoft has joined the Open Source Initiative (OSI) as a Premium sponsor. OSI is a global non-profit dedicated to promoting and protecting open source software through education, collaboration, and infrastructure.

Open source advances come from its community and Microsoft continues to increase its involvement and contributions. Microsoft participates in thousands of open source projects and has thousands of contributors to public open source organizations.

The Open Source Initiative is a cornerstone of open source communities and plays an important role in protecting and promoting open source software, educating the public, and building bridges across different constituencies. Microsoft supports those goals within the company, across the industry, and now, via its sponsorship of the OSI.

The work that the Open Source Initiative does is vital to the evolution and success of open source as a first-class element in the software industry. As Microsoft engages with open

Microsoft + GitHub = Empowering Developers

Jun 4, 2018 | Satya Nadella - Chief Executive Officer, Microsoft

MICROSOFT \ REPORT \ TECH

Here's what GitHub developers really think about Microsoft's acquisition

By Tom Warren | @tomwarren | Jun 18, 2018, 9:24am EDT

SHARE

Now that the dust has settled on the big news of Microsoft's plans to acquire GitHub, developers have had a chance to react. Some are shocked, others are welcoming the move, and most seem to be waiting to see what will happen once the deal closes later this year.

Microsoft will let anyone use 60,000 of its key software patents as it moves to play more nicely with open source developers

Rosalie Chan Oct. 10, 2018, 4:17 PM

Microsoft CEO Satya Nadella has embraced more open-source initiatives for the company. Getty Images

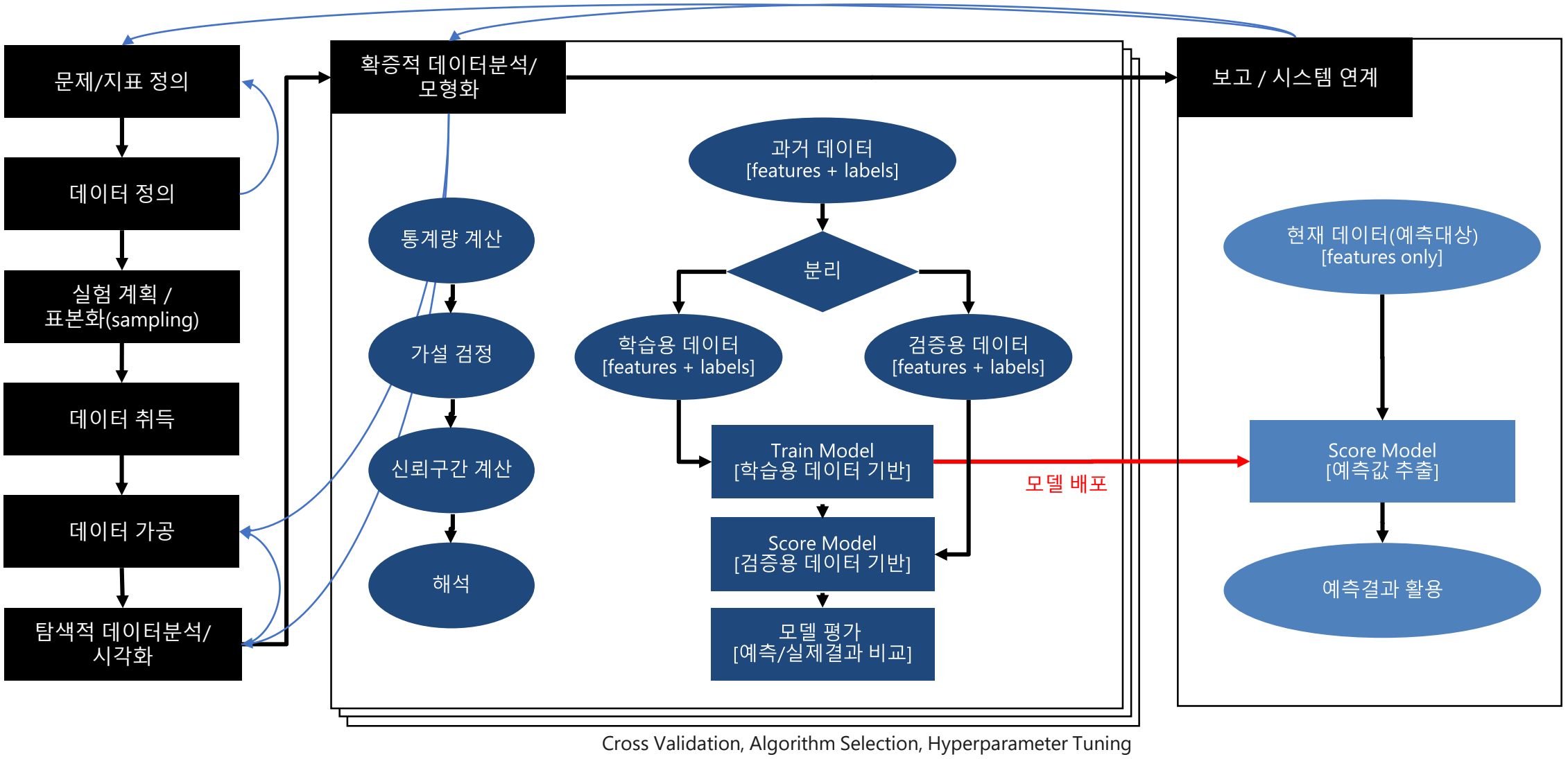
- **Microsoft is joining the Open Invention Network (OIN), a patent community that protects Linux and other open source software programs.**
- **The company acknowledged this decision may be viewed as a surprise, as Microsoft had a long history of competing with open-source initiatives and making billions from its patents.**
- **Microsoft has embraced open source initiatives in more recent years and plans to bring 60,000 patents to OIN.**

Microsoft announced today that it's joining the Open Invention Network (OIN), an open-source patent community — basically, allowing anybody to use some 60,000 software patents that the tech titan holds, without having to pay any kind of licensing fee.

The move comes as a huge boon to the world of open source software, which is written collaboratively, freely available and can

Data Science Process

데이터 과학은 "컴퓨터 도구를 효율적으로 이용하고, 적절한 통계학 방법을 사용하여 실제적인 문제에 답을 내리는 활동"이며, 데이터 과학 프로세스는 전 단계에 걸쳐 발견되는 데이터 분석결과에 따라서 능동적으로 적응하면서 점진적, 순환적인 과정을 거치게 됩니다.



Operationalizing R Model

Microsoft Machine Learning Server는 오픈소스 R을 기반으로 병렬처리 프레임워크 및 라이브러리, 빅데이터 플랫폼과의 결합, 다양한 서비스 배포 패키지를 제공합니다.

Tools

Visual Studio · Visual Studio Code · jupyter · Rattle · RStudio

Languages

R

Algorithms

Open source R algorithms and visualizations:
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Distributed parallelized algorithms:
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- MicrosoftML library
- Custom parallelization frameworks

Plus:
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Operationalization

{Mrsdeploy}

RESTful API deployment

{AzureML}

A CRAN Package to deploy to Azure ML Web Service

Microsoft SQL Server

In-database deployment

Real-time scoring

Visualization Tool Integration

Operationalizing R Model

Mrsdeploy라는 Microsoft Machine Learning Server에 포함된 패키지를 이용하여, On-premises 상에 구성된 서버 Grid에 웹서비스 형태로 R Model를 배포합니다. AD/LDAP 인증 및 TLS 암호화로 보안이 강화되며, 웹노드 및 컴퓨트노드를 Scale Out 가능합니다.

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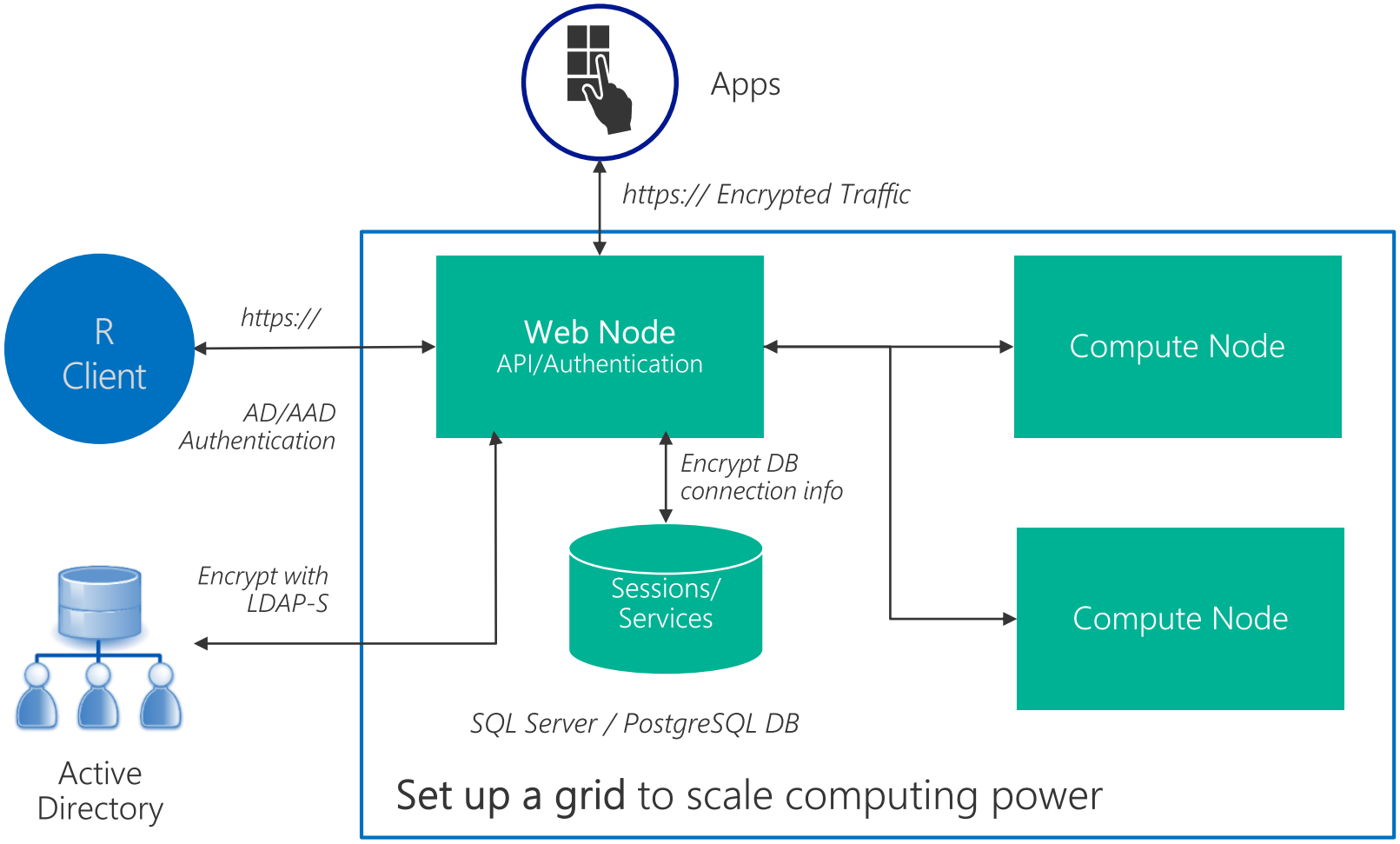
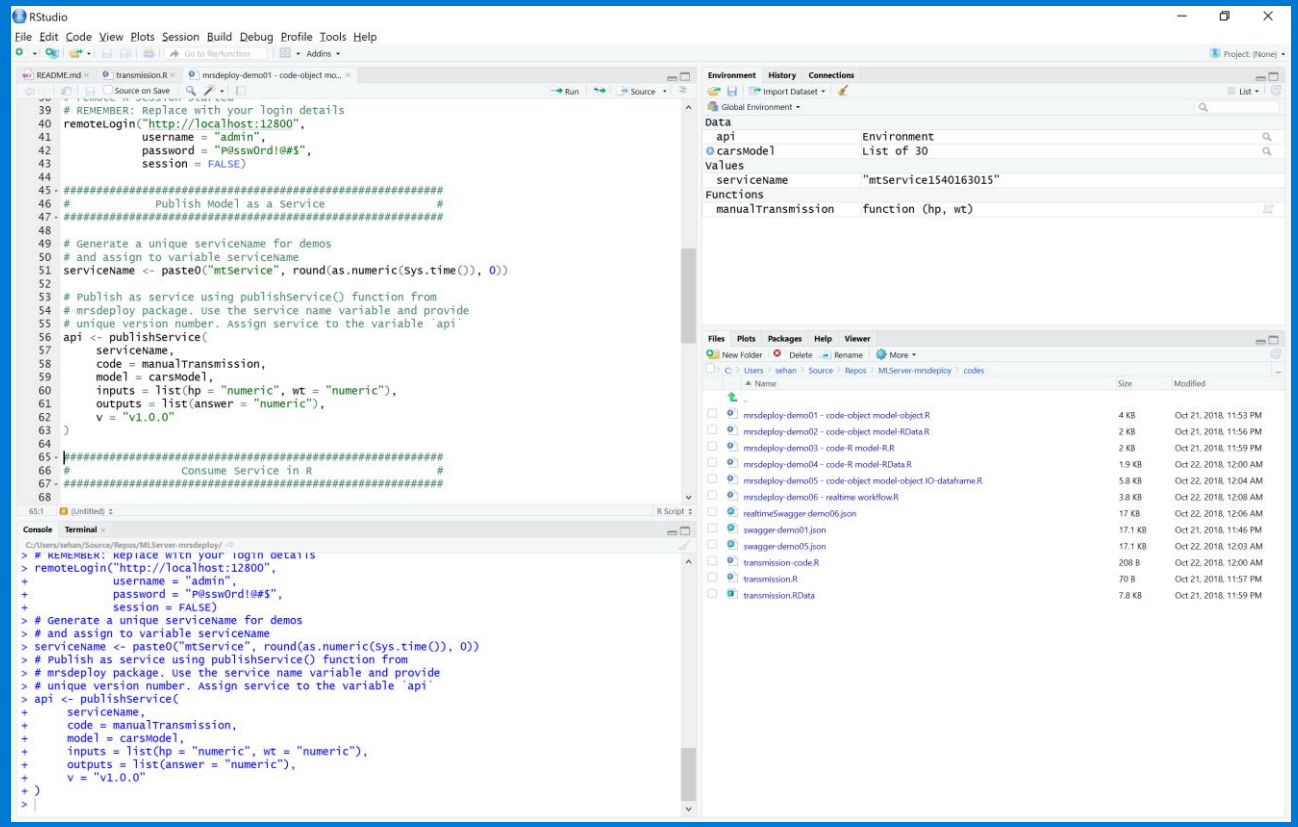


mrsdeploy Demo

RStudio
Microsoft ML Server
Swagger.io
Postman



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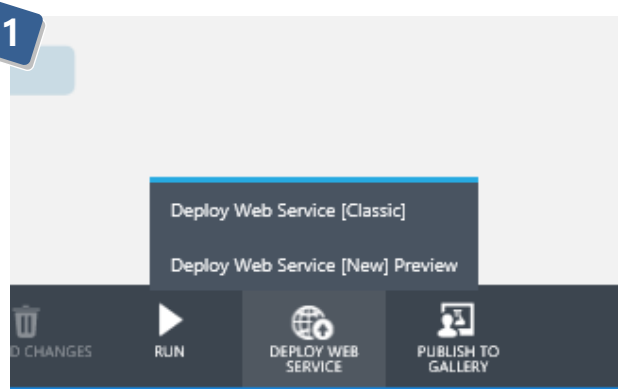


"One-click Publishing"
Azure ML Studio에서 모델 생성 이후 기본 메뉴 클릭 엑션을 통해 배포 작업 가능

2

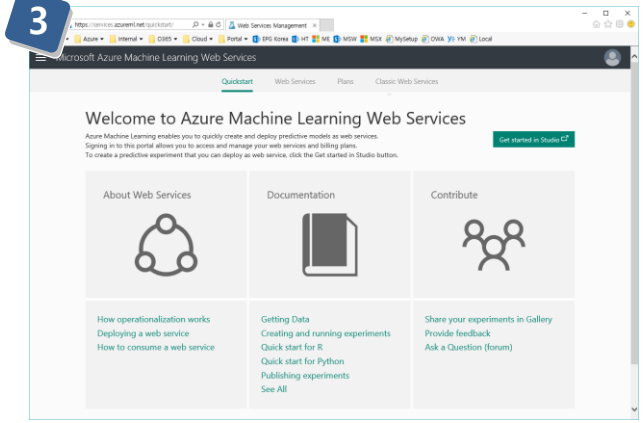
```
# Publish the service
ep <- publishWebService(ws = ws, fun = mypredict, name = "AzureML-vign
                        inputSchema = test)

# Consume test data, comparing with result above
print(consume(ep, test))
```

```
converting `inputSchema` to data frame
```

```
      ans
1 24.54431
2 21.15155
3 33.88859
4 34.06615
5 34.93906
```

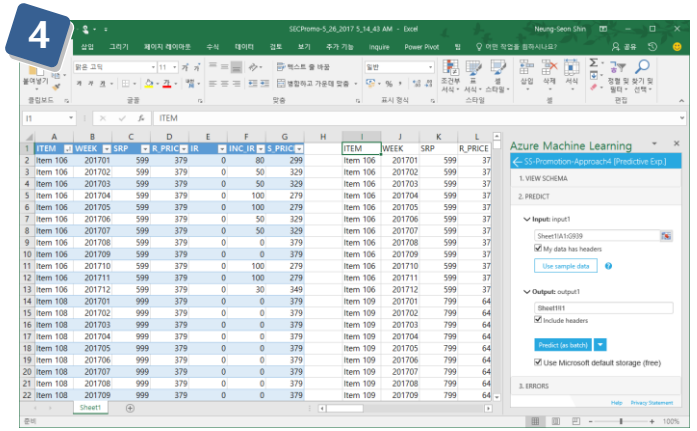
CRAN {AzureML}로 오픈소스 R에서 직접 배포
Azure ML Studio Workspace ID 및 키로 접근하여 웹서비스 직접 배포 가능

3



내장 Web Service 제공
유지보수 최소화 – Scale Up/Down, 키 기반 보안 접근 등 자체 내장

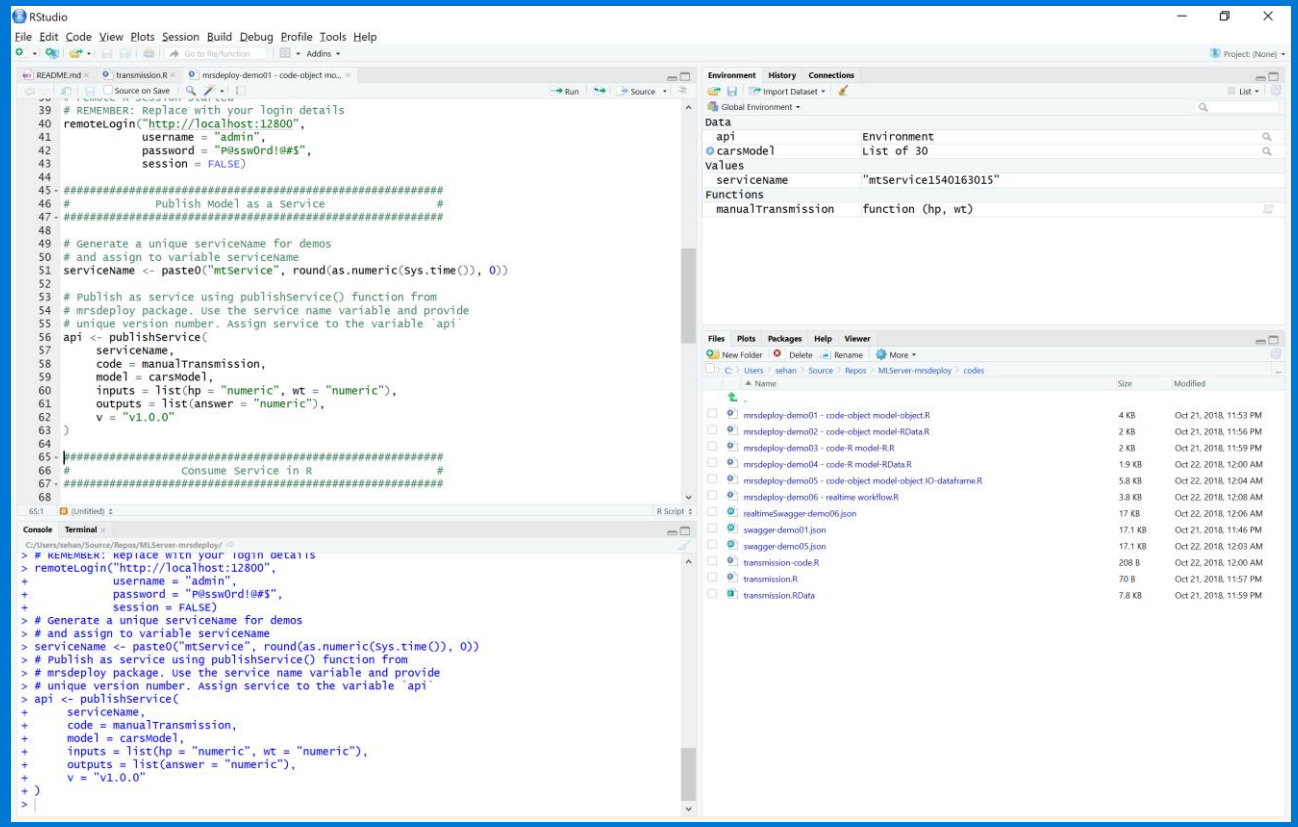
4



외부 App을 통한 모델 활용
Excel을 비롯한 외부 App에서 간단한 Key 호출 작업을 통해 API를 호출하여 모델 사용 가능

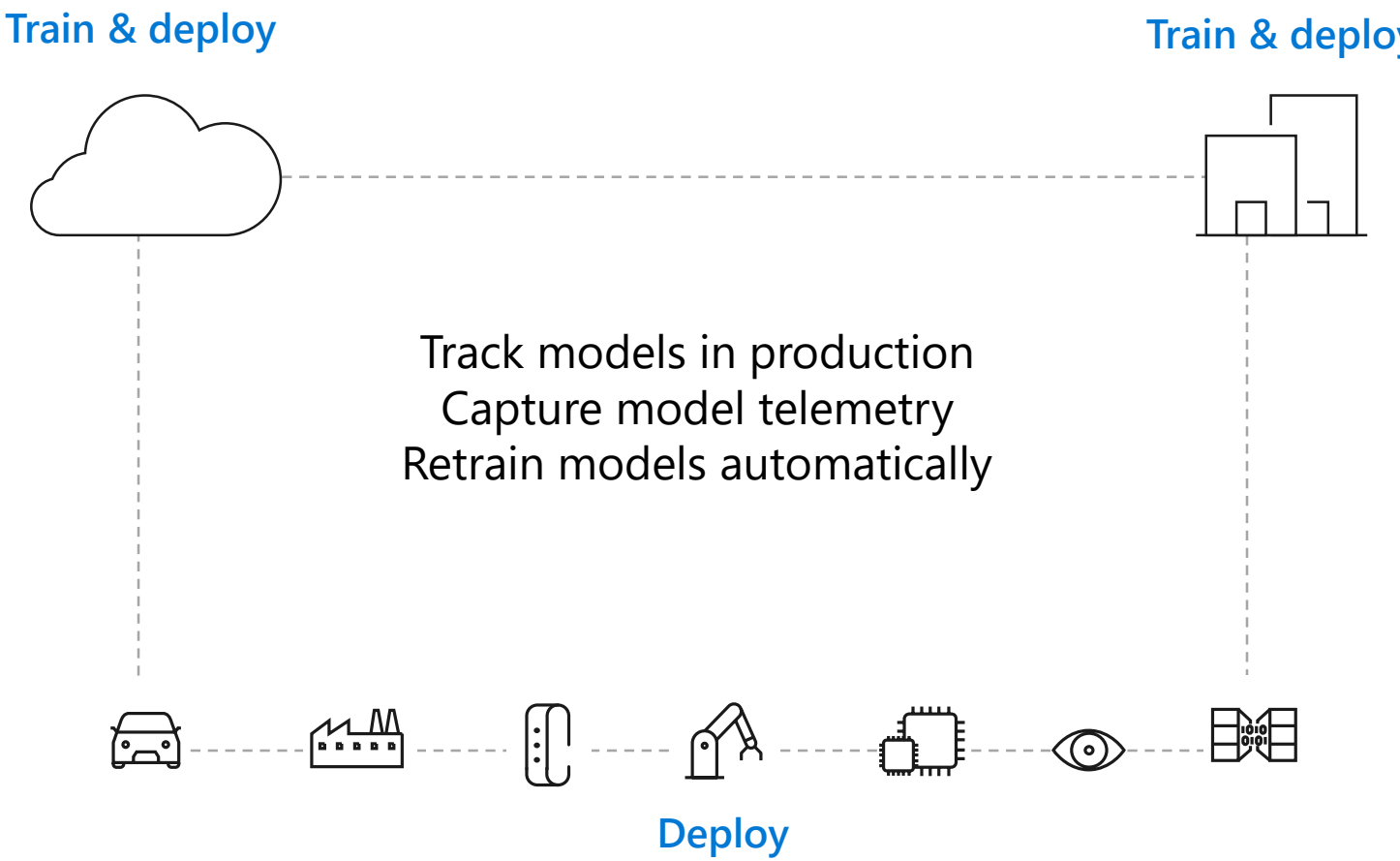
AzureML Demo

Azure Notebooks
CRAN {azureml}
Azure ML Studio
Excel Add-in



Flexible deployment

Deploy and manage models on intelligent cloud and edge



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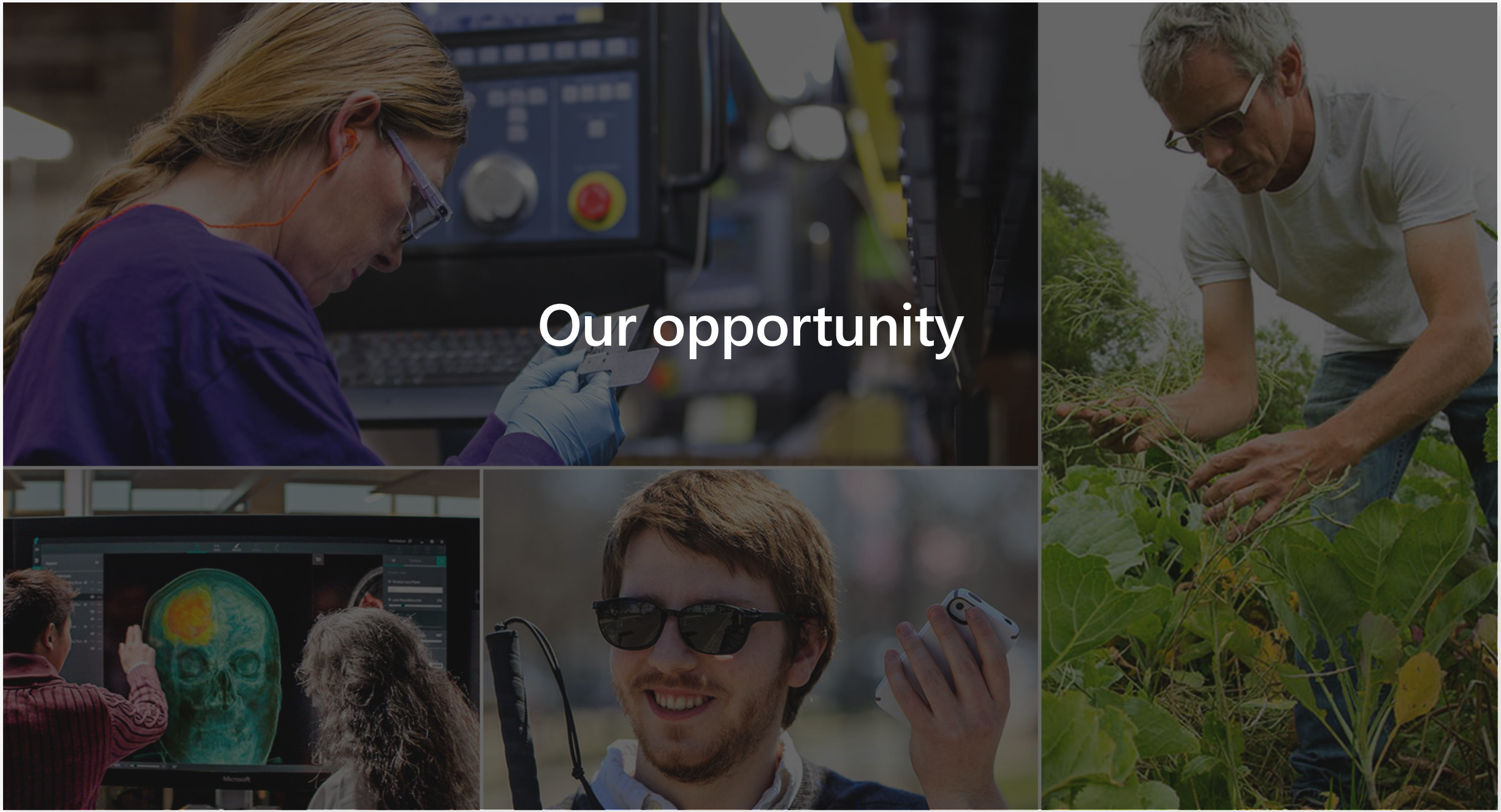
Our opportunity

Thank you

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