



RHOAI Product Overview

Study Guide

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This handout is designed to summarize the content delivered in the Red Hat OpenShift AI Product Overview course.



Note: The Red Hat OpenShift AI (RHOAI) product was formerly Red Hat OpenShift Data Science (RHODS). Some graphics, audio and video retain the original product name.

Course Objectives

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Lesson Two: What are the Red Hat OpenShift AI features?

Lesson Three: What are the RHOAI key functions and capabilities?

Lesson Four: What are the RHOAI consumption models?

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Course Objectives

- Describe the general purpose and value of Red Hat OpenShift AI.
- Explain the basic technology concepts associated with Red Hat OpenShift AI.
- Describe major features and components of Red Hat OpenShift AI.
- Explain the factors behind the major features and components of Red Hat OpenShift AI.
- Explain what Red Hat OpenShift AI allows a user to do.

Lesson One: What is Red Hat OpenShift AI

Lesson Objectives:

- Describe the general purpose and value of Red Hat® OpenShift® AI (RHOAI).
- Explain basic technology concepts associated with RHOAI.

Knowledge Checks

Question	Choice A	Choice B	Choice C	Choice D	Answer
Which of the following is a characteristic of Red Hat OpenShift AI?	Open source AI projects that encourage silos.	Runs anywhere OpenShift does.	Containerized platform for traditional applications and AI/ML applications.	Unsupported by Red Hat.	B
Responses	Incorrect. RHOAI is meant to eliminate silos by running all AI models through a common development model.	Correct! OpenShift is key to integrating RHOAI. Organizations that are already using OpenShift have a head start on automation with AI.	Incorrect. RHOAI is meant to act as a universal platform for AI development across an enterprise.	Incorrect! RHOAI can be offered as part of a support subscription package with management from Red Hat.	

Select the best answer. Define Red Hat OpenShift AI.	AI-focused portfolio that provides tools across the full lifecycle of AI/ML experiments and models.	A platform for deploying only models optimized for hybrid cloud environments.	Can be managed on-premise only.	The foundation of how AI collects information for later.	A
Responses	Correct! RHOAI is a group of AI tools that can be applied across a full development cycle of AI and ML experiments.	Incorrect! RHOAI can be deployed across on-prem and hybrid cloud environments.	Incorrect! RHOAI can be deployed across on-prem and hybrid cloud environments.	Incorrect! RHOAI consists of the tools for an entire lifecycle of development. Collecting information or user data is only a part of the lifecycle.	

Takeaways

1. RHOAI is an AI-focused portfolio that provides tools across the full lifecycle of AI/ML experiments and models.
2. RHOAI is a self-managed or Red Hat-managed service for Red Hat OpenShift Dedicated that supports (AI) and (ML). It is based on the upstream Open Data Hub project (an AI-as-a-Service platform based on OpenShift Container Platform and Ceph Object Storage).
3. RHOAI supports artificial intelligence (AI) and machine learning (ML) experiments and models, and is a platform for building, training, testing, and deploying models optimized for hybrid cloud environments.

Lesson Two: What are the Red Hat OpenShift AI features?

Lesson Objectives

- Explain the major features and components of Red Hat® OpenShift® AI (RHOAI).
- Explain why these features exist in RHOAI.

Knowledge Check

Question	Choice A	Choice B	Choice C	Choice D	Answer
Select the best answer: What are the steps in a	Results examination, users survey, model design	Needs assessment, model testing, marketing	Business assessment, data analysis, deployment	Data preparation, model creation,	D

machine learning lifecycle?		results		deployment	
Responses	Incorrect! Examining results and designing the AI model occur midway through the ML lifecycle.	Incorrect! None of these are steps in the ML lifecycle.	Incorrect! Building AI models must occur during the ML lifecycle, or there is nothing to deploy!	Correct! First comes data prep, then model creation, then deployment.	

Takeaways

1. The most important features and components of RHOAI are self-managed or Red Hat-managed cloud service, tested and supported AI/ML tools, your choice of technology partners, and the ability to scale quickly. RHOAI also allows users to develop best practices for AI/ML.
2. A machine learning workflow process begins with gathering and prepping data, developing a model, deploying the model, monitoring the model, and refining the model.

Lesson Three: What are the RHOAI key functions and capabilities?

Lesson Objective

- Explain what Red Hat® OpenShift® AI (RHOAI) allows the user to do.

Knowledge Checks

Question	Choice A	Choice B	Choice C	Choice D	Answer
Select all answers that apply. The key functions of RHOAI are:	Collaboration	AI/ML operations support	Partner integration	Turnkey deployment.	A, B, C
Responses	Correct! Collaboration, AI/ML ops support, and	Correct! Collaboration, AI/ML ops support, and	Correct! Collaboration, AI/ML ops support, and	Incorrect! Collaboration, AI/ML ops support, and	

	partner integration are the key functions of RHOAI. Turnkey deployment is not a key function.	partner integration are the key functions of RHOAI. Turnkey deployment is not a key function.	partner integration are the key functions of RHOAI. Turnkey deployment is not a key function.	partner integration are the key functions of RHOAI. Turnkey deployment is not a key function.	
Select the best answer. What was the business challenge that the customer story in this lesson solved with a RHOAI application?	Organizational decisions were delayed because there was no universally applied production model.	Employees unionized.	The AI/ML options cost too much.	The AI/ML options were impossible to maintain after an employee left.	A
Responses	Correct! The key issue here is that the business could not translate the varying AI/ML models into a source of truth for decision making.	Incorrect! The customer story does not indicate this. However, silos discussed in the story makes this AI/ML strategy extremely vulnerable to loss of control for those in charge of translating data into growth	Incorrect! The customer story does not indicate cost. However, getting all of the AI/ML models under one process should cut down on redundant work spread across multiple data scientists.	Incorrect! The customer story does not indicate this. However, the silos and multiple development flows make this organization vulnerable to a loss of domain knowledge if employees were to leave.	

Takeaways

1. The key functions of RHOAI are collaboration, AI/ML operations support, and partner integration.
2. RHOAI is particularly useful for applications in government and security.

Lesson Four: What are the RHOAI consumption models?

Lesson objective

- Describe Red Hat® OpenShift® AI (RHOAI) consumption models.

Knowledge Checks

Question	Choice A	Choice B	Choice C	Choice D	Answer
<p>Select the best answer.</p> <p>Developers familiar with ___ will be able to easily integrate RHOAI into their workflows.</p>	Performing needs assessments	assessing artificial intelligence models	OpenShift	surveying peers for ideas	C
Responses	<p>Incorrect! Needs assessments will be carried out by the business division of an organization if needed. Developers may review these when building models, but will not need to perform them.</p>	<p>Incorrect! Developers do not need to be familiar with assessing AI models. Developers may only be experienced how best to build commands, then on improving them based on the data collected by iterative AI models</p>	<p>Correct! Any developer with OpenShift experience will have a head start on using RHOAI in their workflows.</p>	<p>Incorrect! Developers do not need to be experienced in surveying or collecting ideas from their peers to integrate RHOAI. RHOAI allows for one model of AI/ML development, and that model should be standardized across an organization.</p>	
<p>Select the best answer.</p> <p>In the AI/ML success story video, what step did Henry and Sarah follow</p>	Collect more data.	Seek more funding.	Hire more staff.	Decide to scale.	A.

after data collection?					
Responses	Correct! Henry and Sarah have collected their initial data, but will need more to understand if their model needs refining.	Incorrect! Henry and Sarah have no idea if they need to expand their budget yet. Their initial model may be fine, but they don't have enough information yet.	Incorrect! Henry and Sarah still need to see if their initial data can be managed between the two of them; they'll need to collect more to understand what the next steps are.	Incorrect! Henry and Sarah don't have enough information to decide to scale. They'll need to move from data collection, to refining their model, then deployment to better assess scalability.	

Takeaways

1. According to a report from Gartner, 55% of organizations that have deployed AI take an AI-first strategy with new business use cases.
2. RHOAI is a natural next step for clients already using OpenShift. Developers familiar with OpenShift will be able to easily integrate RHOAI into their development workflows.

Lesson Five: How does RHOAI fit in the Red Hat Portfolio?

Lesson Objectives

- Describe Red Hat's overall portfolio of products.
- Explain where Red Hat® OpenShift® AI (RHOAI) fits in the Red Hat portfolio of products.

Knowledge Checks

Question	Choice A	Choice B	Choice C	Choice D	Answer
Select the best answer. RHOAI can only be used if:	automation has been identified as a key business priority.	users have built enterprise solutions on OpenShift.	users have a deep understanding of data science.	on-prem hybrid cloud solutions are used.	B
Responses	Incorrect! The business does not need to ID automation as	Correct! Developers who have already adopted	Incorrect! You don't need an understanding of data	Incorrect! RHOAI can be applied to both on-prem and hybrid	

	a priority. RHOAI can be adopted as the natural next step for developers interested in streamlining and managing existing automation procedures. If the developers are using RHOS already, they can integrate their efforts easily.	OpenShift will quickly discover that their applications translate well to the additional services offered with RHOAI.	science to explain the benefits of RHOAI. A familiarity with the benefits of automation should be enough to get you started.	cloud solutions. Remember; on prem solutions are managed by the customer, but hybrid can be either self-managed or managed by Red Hat.	
Select the best answer: The relationship between Red Hat OpenShift and RHOAI:	is monitored by outside open-source experts.	makes it easier to outbid competitors.	allows users to run more applications in a smaller, cheaper server cluster.	lets DevOps skip data collection procedures.	C
Responses	Incorrect! Red Hat OpenShift and RHOAI integration is not monitored by outside open-source experts. Bug-reporting is a user initiative, but bugs reported to managed RHOAI accounts will be addressed by Red Hat developers.	Incorrect! The relationship between Red Hat OpenShift and RHOAI does not necessarily allow organizations to outbid their competitors. However, RHOS and RHOAI integration can allow users to develop models that allow them to deliver applications	Correct! Red Hat OpenShift/RHOAI integration allows more actions to be stored on the same server cluster, allowing for more efficiency.	Incorrect! While RHOAI will make data collection simpler and less labor-intensive, data still needs to be collected.	

		and services, faster, with fewer resources.			
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Takeaways

1. Red Hat's portfolio of products consists of enterprise open source software solutions.
2. Red Hat Enterprise Linux is the Red Hat enterprise platform for Linux applications.
3. Red Hat OpenShift is a unified platform to build, modernize and deploy applications at scale.
4. RHOAI is a self-managed or Red Hat-managed service for Red Hat OpenShift Dedicated. This means that all the features and benefits are only available if users have built their enterprise development solutions on Red Hat OpenShift.
5. RHOAI supports AI and ML experiments and models and is a platform for building, training, testing, and deploying models optimized for hybrid cloud environments.

Transcripts



Note: The Red Hat OpenShift AI (RHOAI) product was formerly Red Hat OpenShift Data Science (RHODS). Some graphics, audio and video retain the original product name.

Lesson One: What is Red Hat OpenShift AI?

Audio: What are the origins of RHODS at Red Hat?

Two main reasons that come to mind first. The upstream project, so the father or the mother of OpenShift Data Science is this open source project called Open Data Hub. That is freely available, anyone on the internet can download it and they can open Data Hub on top of OpenShift. That was already available.

Audio: What did customers ask Red Hat for?

The feedback we had from customers was, "This is nice, we like the software, we like the ability to run all of this, one thing is missing, though, we don't get any support. We can pull down the software, but if we have an issue (as customers) (with it), we call Red Hat and it's like "hmm, ok, maybe some volunteer will fix the bug at some point in the future."

Customers felt like they were enterprise clients and, as customers, they needed something they could trust, that people would take their bugs seriously and fix them.

Audio: Where did OpenShift AI and OpenShift Data Science come from?

The software has existed before, but a lot of customers were willing to pay for support for that same software. That's what led to the creation of OpenShift AI and OpenShift Data Science.



To summarize; the first reason is demand from customers [Customers say] “we like software, we just want it to be a product so we can get support. We are willing to pay for that.” The second thing is; when it comes to all the sorts of things you can do on an OpenShift cluster, there are things that are well-suited to it and some things that are less well-suited for it. Data science and AI/ML workloads are really, really well-suited to be running on OpenShift and Kubernetes environments. This is what we are seeing a lot of the world is moving towards.

We’ve been doing traditional software for a very long time. JBOSS applications, things like that. Web applications, web services, microservices. These have been around very very long. Data science and AI/ML have been around for a while too, but it’s really picking up.

Audio: How does this relate to the market for AI?

Every company wants to create their own models, their own “I want to do product recommendations, like Amazon does. I’d like this, or this, how do I do that? I’ve built a transactional website, that’s nice, that’s traditional software. What I want now is a model that’s going to analyze my customer behavior and make predictions and optimize things.”

There’s a big shift towards this. That shift has been growing. Now with things like ChatGPT coming out, everybody is in a frenzy and super-excited about this. Everybody is trying to capitalize on this type of software, essentially.

Video: What is Data Science?

Hello, I’m Frank La Vigne, the Global Go-to-Market Lead for Data Services at Red Hat, and today, we’re going to answer the question: “What is data science?” After watching this video, you’ll know the basics of data science, machine learning, and its importance to the modern enterprise.

Just as you don’t need to write code to speak intelligently about Kubernetes, you can rest assured that the same holds true for data science. In short, you do not have to be a mathematical genius to sell data science solutions.

By now you’ve most likely heard the terms data science, and related buzzwords like artificial intelligence, AI, and even machine learning. You may have even heard the phrase ‘data is the new oil’ and wondered exactly what that means. If so, then this is the video course for you.

So, what exactly is data science? Well, don’t take it from me, let’s ask ChatGPT to explain it.

You know, watching text type is kind of as exciting as watching paint dry. Why don’t we ask Patrick Stewart to read it out loud? The goal of data science is to help organizations and individuals make informed decisions, optimize processes, and solve complex problems.



OK, that actually wasn't Patrick Stewart, that was an AI tool called VoiceAI that mimics different celebrities. They have thousands of models you can download and impersonate somebody's voice.

But what if I wanted an actual virtual presenter to explain it to me? Let's see what that looks like.

Think of data science as a detective that sifts through information your business collects and turns it into actionable insights. These insights can help executives make data-driven decisions, improve processes, identify new opportunities, and ultimately increase profitability and growth.

For instance, data science can help a business executive understand which products are selling best, who their most valuable customers are, and how to optimize their marketing efforts for better results.

By leveraging the power of data, executives can make more informed decisions and stay ahead of the competition.

Video: Data is all around us

Data is all around us, and you, yes, you, are constantly generating data. Whether it's from the apps you use on your phone, a smartwatch, the actions you take as you browse the web. And businesses take that and aggregate it to provide insights into shopping patterns and more.

Now another word here about terminology. You've heard me say data science, you've heard me talk about AI and machine learning. All of these terms have separate meanings, but in usual, normal conversation, they are used interchangeably. And the term data science itself is a catchall term for any number of tools and techniques that collect data and find insights. Most of this work is based on mathematical and statistical analysis. The minutiae and particular types of this analysis are largely irrelevant to business users and technical decision makers. At the end of the day, what matters most is a scalable and manageable solution that fits the needs of the business.

So what is an intelligent application? Intelligent applications, as the name implies, are regular applications infused with the power of artificial intelligence. But what does that really mean? In short, data scientists work through mass quantities of data to find hidden patterns, looking for some insights.

Usually they follow the scientific method, such as; create a hypothesis, test the hypothesis, and then evaluate its validity. The process is repeated until the data scientists have created a mathematical model that can make a reasonably accurate prediction or inference based on new input data. That model is then deployed, usually as a containerized web service. Application developers then consume this model and



integrate it into their existing code base. The model has now been deployed and application developers have added it to their code base.

The application is now intelligent. And the business users are now happy. But then something happens. The model begins to become less accurate, sometimes slowly, sometimes quickly. Business users start to notice the error. Data scientists are receiving complaints and begin to wonder, what happened to our wonderful model? This is a phenomena known as model drift. A model's accuracy starts to 'drift.' The best way to grasp this concept is to think about the weather forecast. The 10-hour forecast is going to be far more reliable than the 10-day forecast and orders of magnitude more reliable than the 10-month forecast. Mathematical models, no matter how well designed, cannot take into account all of the entropy in the universe. Which is a very fancy and overstated way of saying that predicting the future is hard!

Video: MLOps is DevOps for machine learning

This dives into the topic of what is known as MLOps. So given that these models are expected almost always to shift; how can businesses manage this risk? The answer is MLOps, which is essentially DevOps, but for machine learning. Now think about it. The process is almost identical; there are no coders churning out code. There are data scientists producing models. Now, the data scientists do produce code to generate these models, but their output is the model, not the lines of code to produce that model. The models don't have bugs or feature requests per say; but the accuracy and precision of the model predictions can be tracked and monitored. Once a model hits a certain threshold; and it's no longer as accurate as they need it to be; the model can then be re-trained with new data that has been collected. Data scientists can then gather new data, then craft a new hypothesis to fit what's changed; and again, once they've fit the desired level of accuracy achieved, the data scientist will then re-deploy the model and the process starts all over again. It does sound an awful lot like DevOps, doesn't it?

Data scientists use terms like XGBoost and random forest model, much to the dismay of their non-data scientist colleagues. It's not the mathematical methods that make data science essential to the enterprise. It's how quickly data science teams can iterate models to production. It's about business value.

The shortest path to business value is to bring data science into the fold of DevOps under the umbrella tool of ML ops. In the last decade or so data scientists were treated very differently. They were treated like the special little unicorns that they were. But now that their presence and their output is essential to the success of any modern enterprise, they need to be brought into the fold and into part of a much larger process.

Video: The importance of infrastructure to data science

I'm your host, Frank LaVigne, the Global Go-to-Market Lead for Data Services here at Red Hat. Now I want to do something a little bit different today. I want to talk about the importance of infrastructure to data science. Now as data scientists, we tend not to think



about all of the work that goes into recording our workloads and our research. I'm going to do something a little bit different, I'm going to switch to a whiteboard, and I'm going to talk about the big picture of data science, and infrastructure, and how it all comes together.

So, if you're not a data scientist, keep watching because this part's for you, and if you are a data scientist, you'll get an appreciation for all of the work that goes into supporting some of the cutting edge research going on.

Video: Machine Learning Operations: a real-world example

Alright, now that I have my handy dandy board here, I can talk about the big picture of data science, engineering, ML Ops, the whole thing.

But first, I'm going to tell you a story, and this story involves gemstones. So a few years ago, my family and I went on vacation to the mountains of North Carolina. And I kept seeing all over the place, "gem mining here, fun for all ages." My first thought was, "well, are we going to all put on helmets and hats and, kind of figure out, well, what's going on here? What is this gem mining thing?" I had images of going down into a deep dark tunnel with, you know, a flashlight and a pickaxe and a helmet. But that's not exactly what it is.

So what you do is, you buy a big bucket that's filled with dirt and rocks. Then what you do is you run the water through a flume. What you get out of that is a bunch of nuggets with crystals in them. Precious stones, basically. Then the better places will tend to have gemologists on staff. They all have gemologists on staff, but the better places will have geologists available. And they'll take a look at the stones. And, this is a geologist or gemologist. They'll take a closer look at these rocks. That's not a two-headed person, that's a magnifying glass. I'll add a smiley face. They take a look, and they notice if there are crystals in there that are worth cutting and polishing. So then for an additional fee they are happy to take these raw rocks and cut out and get the crystal. Into a polished gem. The end result is, kinda, that. But that's not really the end result. For an additional fee, they are happy to take this gemstone and mount it onto a ring, a necklace, and earrings too.

Now this whole time, as I'm sitting there in the water, in the flume they have going, I start thinking, "you know, this reminds me a lot of work." And I don't mean actually the physical work of picking up these big heavy cans of dirt and rocks and putting them through water, I mean this reminds me of my day job.

Bear with me now, because I'm going to bring it all back into data science. So this here, this bucket of dirt, that you buy, that you get, right, is essentially, raw data. And this right here, I'll call these business insights. Or business intelligence, these raw nuggets of, "hey, I noticed when a customer bought peanut butter, I noticed that they are also going to buy bread and grape jelly. These are basic kinds of analysis. And this here, really, this kind of process of going from one to the other, reducing the raw data features and finding the models. It's kind of data engineering, isn't it? I'm not even going to attempt to draw a flume. After that is the running water you go through, kinda like in the Old West, they



show people panning for gold. It's a bit like that. There's a little pan and you put the rocks in and run it through water. That's the data engineering process. Then this person here, the gemologist or geologist, is very analogous to the data scientist. Then of course, what does the data scientist produce? Produces a model. Data scientist produces a model.

Well now you're probably thinking, "well Frank, I see where you're going with this, but what about the rings, and necklaces and earrings?" Well this is actually pretty easy, because this says it all. Deployment. Right? Now at each one of these phases, there are different skills.

Also the same thing at these mining places. There's a different skill set, you can do this industrially. Now for small teams, a person could do it all, for small projects. The overall process here, as you're taking this raw data, and raw data is, well, data is the new oil, it is valuable, but just like oil, if you're getting it out of the ground, it does have a certain amount of value. The real value, where it really provides utility, is when it's processing and refined. It's the same thing for gemstones, and it's the same thing for data. That's really the big key here. This doesn't really capture the full glory of ML ops, I'll get to that in a minute.

Video: Let's talk about Chat GPT

Let's talk about something that's in the news right now. That's GPT or Chat GPT. I'll talk about GPT because I have a little more information on how this was generated. [GPT-3] This was trained on billions of parameters. Input parameters. Not going to do a deep dive into PERT models or transformers, because again, I'm really trying to address this towards folks who are not necessarily data scientists and they are curious what the Red Hat story is here.

Billions of parameters, huge amounts of documents. The cool kids call this a 'corpus of material.' Huge amounts. So I want you to sit back and think about this. What did this process look like? I'll tell you right now, it probably looked a lot like this [gem mining model]. In the sense that they had these huge sets of documents, just mass quantities of documents that had to be processed and filtered. Just like I did with the flume and the water.

I would imagine that to go through that amount of material, the data labeling going on, and there's been some bits in the news about how that was done, and some of the issues that have come up around that. But I'm certain that there were quite a number of engineers helping to process and refine this, and expose the text to these human readers or reviewers. So I would say that by taking all of this data, and this would be the huge corpus of material, going through, and handing this off to the people to process this, to do the pre-processing, I would say this a substantial amount of work even for the first scientist to look at it.

I think this really speaks to, you know, we think about 175 billion, which I think is the number off the top of my head, input parameters. An input parameter and a transformer does not exactly map 1:1 with characters or words. But think about the amount of storage.



How big would that bucket have to be? 175 billion input parameters for the neural network, right? That number is here [bucket in gemstone model]. How many documents, and just raw data sets, how much does that go into? Did that exist in a vacuum? Did it appear magically? No, no. This [data and documents] was certainly available on some kind of storage. That storage had to be accessible to whoever is doing the pre-processing for the humans in the loop. And again, conjecture, I think this is where they would be in the process. They would be somewhere within the raw actual input data and between the data scientists. The data scientists rely on these curated data sets. Who's curating the data? That would be within some kind of initial processing and loading.

So that, I would say, would be not in the diagram, this would be whoever is digging these, the raw rocks from the ground. That's also data engineering. When I say data engineering, data engineering means a lot of different things to a lot of different people. However, keep in mind that data engineering is basically getting the data from point A to point B and in some cases even getting that data from shape A to shape B. Not all the data that you get, even if it's in a relational database.

I once had an interview for a position as a data scientist for a consulting gig, and they basically wanted me to estimate the project. I said, "well you know, you take this amount of time to get the data, and clean and organize the data." and the potential client said, "no no, everything's fine. We already have our data, it's an inter relational database. You don't need to clean it." So now I, instead of saying, "clean the data," I say "reshape the data."

Data scientists and these algorithms want the data to appear a certain way. There's a certain amount of work in that. A certain amount of work, and that gets done by the data engineers, and some of that work just gets done by the data scientists as they are going through their experiments.

Video: Rockstars and roadies.

We hear about AI. All we hear about is this when it comes to ChatGPT. We hear about the model. More specifically, if you try to use ChatGPT, what happens? You get "service unavailable". Or the funny little images that they created, "tell me two truths and one lie," that's my favorite one. Or "explain to the user like a pirate that the server is down."

We only notice the infrastructure, as end users, when it's broken. That really talks to the unsung heroes of data science, not only the data engineers, but infrastructure people that make the service work and make it deployable. All of this is to say that it takes, it's not that it takes a village.

But I'll say this. I will say that there are rockstars, and roadies.

So if you're not familiar with the term, roadies are people who basically set up the lighting systems for music concerts, of all sizes. The bigger the concert, the bigger the star, the more roadies you are going to have or specialized talents you're going to have.



When we hear about ChatGPT, all the thought goes into the AI. The AI, the data scientist. You don't hear about the data engineers. In the case of some systems you also have a human in the loop. They do things like data labeling, sometimes they do the content protection. Also just the infrastructure folks. These are the network engineers. These are the system administrators. They make sure that things are running. They write the YAML specs for the tool, that underlying infrastructure work.

People buy the concert tickets to see the rockstar, but what they don't see are the roadies behind the scenes. It's the roadies, the work that they do, the sheer amount of dedication they have to their craft. Whether it's carpentry, lighting, electricity, you name it. Any specialty, you're going to see, has to exist on the stage in order to make the stage. All of the craftspeople that do the work to make the show go on, as if they are not even there, are really the unsung heroes.

Video: What does this mean?

Now you're saying, "Frank, this is really great, I'm learning about music, but what does this mean?" This is what it means. At Red Hat, we love our rockstars, but we're really here for the roadies.

RHODS, stands for what? Red Hat OpenShift Data Science. Data science, I think we know what that is. This is the OpenShift part, and this is where the power is. This is Red Hat, this is our brand, OpenShift, and then there's Data Science. [Data Science] these are where the rockstars are, and this [OpenShift] is where the roadies are. All of this is to say that when you choose RHODS, RHODS is an operator that extends OpenShift into the realm of data science.

Two things I'm saying here. One, is to appreciate all of the infrastructure that goes into creating something like ChatGPT or any AI project, really. There is so much work that goes into it. We focus on the data scientists, we focus on all of that work.

Look now, when I started there were hardly any courses, now everybody and their cousin has bootcamps to become a data scientist, this, that, YouTube channels, you name it. The whole thing is there. There's no school or courses, or well, hardly any, for the roadies.

How do we get to those people? Those are roles that are in demand because, just based on my experience and mine is anecdotal, so I don't have hard numbers, so all my data scientists out there, you're going to hear these statistics and numbers, and give me a hard time, and maybe you should.

I have noticed, personally, that for every one unit of data science work, there's about 10 units of data engineering work. I'm guessing that when I upload to a cloud service, you know, 10 gigs of data, 100 gigs of data, I'm guessing there's another order of magnitude of infrastructure going on behind the scenes, whether it's networking, whether it's my broadband provider.



If you think about it this way, we as data scientists really stand on the shoulders of giants, who stand on the shoulders of giants.

Infrastructure, when done right, it's kind of like air. You don't notice it, you don't notice it until something, until there's no air.

Audio: What are the origins of RHODS at Red Hat?

So first let's call it OpenShift AI. Because OpenAI is a company that has nothing to do with Red Hat, and that created Chat GPT. So we want to make sure [we call it] OpenShift AI.

All right, so what does OpenShift AI do? So OpenShift AI itself doesn't do anything because it's kind of a family of products. It's like saying, what does [Microsoft] Office do? It doesn't do anything. But [Microsoft] Word is to type documents, and [Microsoft] Excel is to do sheets and stuff. So OpenShift AI is a family of products, and then the main product within that family is OpenShift Data Science.

Lesson Two: What are the RHOAI features?

Why does RHOAI include these features?

So customers have been using OpenShift to develop software and deploy their software and monitor and manage and all of that stuff for traditional software. But these clusters are not full.

Adding AI-related workloads into those clusters, you can use all of the spare capacity. You make sure that they're fully utilized. So it fits in really well with OpenShift for the Red Hat portfolio.

So I think the other thing that fits really well, is [that] within OpenShift, there is the Operator Hub, which gives you access to all kinds of software, right? So some of it from Red Hat, some of it from Open Source, some of it from ISVs or Community. So that's also a very good mix with OpenShift and AI because you need a MySQL database to do something. You can just go to Operator Hub and get that MySQL database going still in the same cluster. So it fits really well with that.

The other thing too, that is, I think, underestimated is, I think that developers have gotten used to working within an OpenShift context. But before OpenShift Data Science, a lot of the data scientists would work on their own laptop, or they would work on a bespoke Linux server that's been set up for them somewhere.

So you have these developers working in one environment, these data scientists working in a different environment. When they're done with their respective work, you need to mesh this work together. That's hard to do when their working environments are so different to start from.



So this is a problem that we're solving even [when] we don't need to do anything specific. It solves itself because from the start, the data scientists are working in OpenShift, the developers are also working in OpenShift. And so when it comes time to mesh these things together, there's a lot less hurdles to integrate those two pieces together.

Lesson Four: What are the RHOAI consumption models?

How do users consume AI?

Annie Purcell:

So is that one of the consumption models that we are putting out on a platter for clients that you can kind of integrate the workflows between your data scientists and your developers?

Erwan Granger:

Yeah, it's essentially a natural result of things. So we do have some developer-centric offerings like Developer Hub is coming out soon, and people have been using OpenShift for their software development for a while. So it's not an option that you buy if you're using RHODS and if you have developers, they're going to end up working in the same environment and you're going to benefit from that.

Lesson Five: How does RHOAI fit in the Red Hat portfolio?

Where does RHODS fit within Red Hat's overall portfolio?

Annie Purcell:

Can you talk a little bit about where you feel RHODS fits in Red Hat's portfolio? Do you feel like this is something that complements other pieces? Well, I know we're built on OpenShift, but we have a lot of other products that we integrate in and out of there.

Erwan Granger:

So, where does it fit in the portfolio? I think, so I think it fits really well with OpenShift. In the past, you would create one Red Hat server and then you would put one Oracle Database on it, and then you would take another Red Hat server and you would put one web server on it. And so you had a lot of these, kind of 'single use'. The Oracle database server would have to be tweaked and adjusted for a single purpose kind of thing, and the other server had to be tweaked and adjusted in a different way and optimized. With OpenShift, what we are moving towards is; it's a platform that is agnostic as to what you run on it. So you have a bunch of machines underneath, but you treat it as a whole. And if you need specialized machines, you can always add them in.

So this is something that makes sense, but only if you can really have a lot of density. Like having a cluster that's 10% utilized is a waste of money. You could have made it ten times smaller, ten times cheaper, and then it would have been 100% full. So the more



applications you're able to run within the same cluster, the more you're going to be optimizing your spend. So having a cluster that is 95% full means you're making really good use of your hardware and your software investments.

What else do you need to know about RHODS?

Okay, here's what people need to know. You don't need to understand the nitty-gritty details of data science to be able to talk to a customer about this. Just like you don't need to be a senior Java developer yourself to talk to a customer about JBoss.

Resources



Note: The Red Hat OpenShift AI (RHOAI) product was formerly Red Hat OpenShift Data Science (RHODS). Some graphics, audio and video retain the original product name.

Lesson One: What is Red Hat OpenShift AI?

Subscribe to the Red Hat Media Space Channel	Available internally		RHOAI Product Overview Channel
Red Hat OpenShift Data Science Product Page	Available internally	Available externally	https://www.redhat.com/en/technologies/cloud-computing/openshift/openshift-data-science
Introducing Red Hat OpenShift Data Science	Available internally	Available externally	Product Page
What is AI/ML on Red Hat OpenShift?	Available internally	Available externally	Red Hat site
What is OpenShift AI?	Available internally	Available externally	Youtube
Red Hat OpenShift Data Science Technologies Page	Available internally	Available externally	Red Hat page
Red Hat Blog: The moment for AI	Available internally	Available externally	External site

Linux Security Blog: The moment for AI	Available internally	Available externally	external link
Red Hat CEO Keynote: Remarks on AI, new products	Available internally	Available externally	external link
Red Hat OpenShift Data Science Use Cases	Available internally		(Google Drive)
Understanding Data Science	Available internally		Google Drive
What is Data Science?	Available internally		Google Drive

Lesson 2: What are the Red Hat OpenShift AI features?

Introducing Red Hat OpenShift Data Science	Available internally	Available externally	Product page
The 5 people you meet in data science	Available internally		(Google Drive)
Red Hat Technology Basics Glossary	Available internally	Available externally	

Lesson 3: What are the RHOAI key functions and capabilities?

Qualifying existing RHODS leads	Available internally		Google Drive
RHODS wins and use cases	Available internally		OpenShift AI Customer Wins (Google)

Lesson 4: What are the RHOAI consumption models?

Gartner survey	Available internally	Available externally	Gartner survey
From startup to production: an AI/ML success story	Available internally	Available externally	(Youtube embed) Youtube



Lesson 5: How does RHOAI fit in the Red Hat portfolio?

RHEL: One platform, Unlimited potential	Available internally	Available externally	(Youtube embed) Youtube
RHOS overview	Available internally	Available externally	(Youtube embed) Youtube
Ansible Automation Platform Overview Video	Available internally	Available externally	(Youtube embed) Youtube
Red Hat OpenShift AI Demo	Available internally	Available externally	(Youtube embed) https://youtu.be/YUuNQS7gg0