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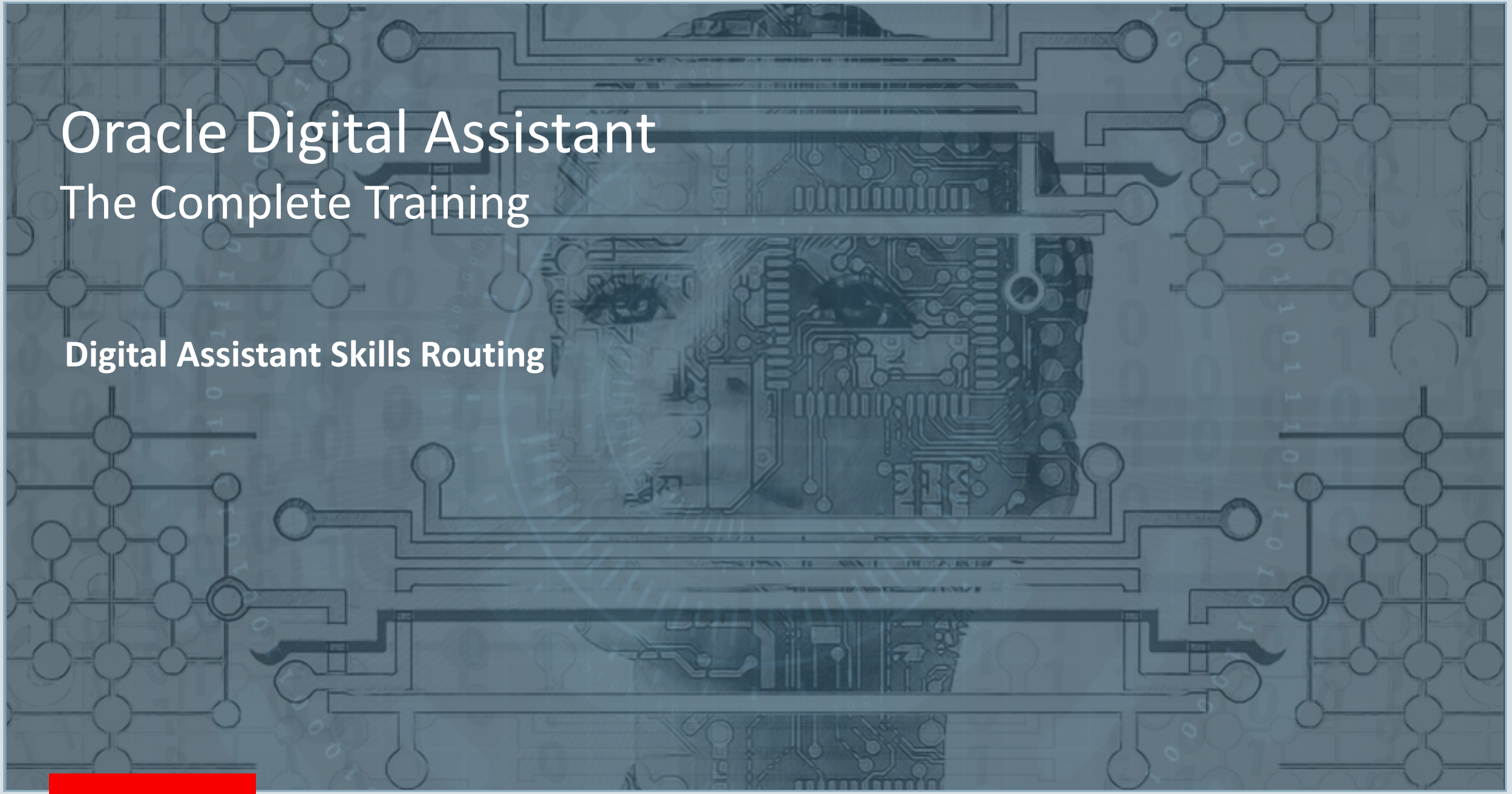
Oracle Digital Assistant

The Complete Training

Digital Assistant Skills Routing



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Topic agenda

1. Recap of chatbot anatomy, skills, routing intro
2. Routing terms and concepts, Implicit/Explicit routing
3. Built-in Digital Assistant intents/routing
4. Tuning the routing model
5. Dealing with unresolvedIntent

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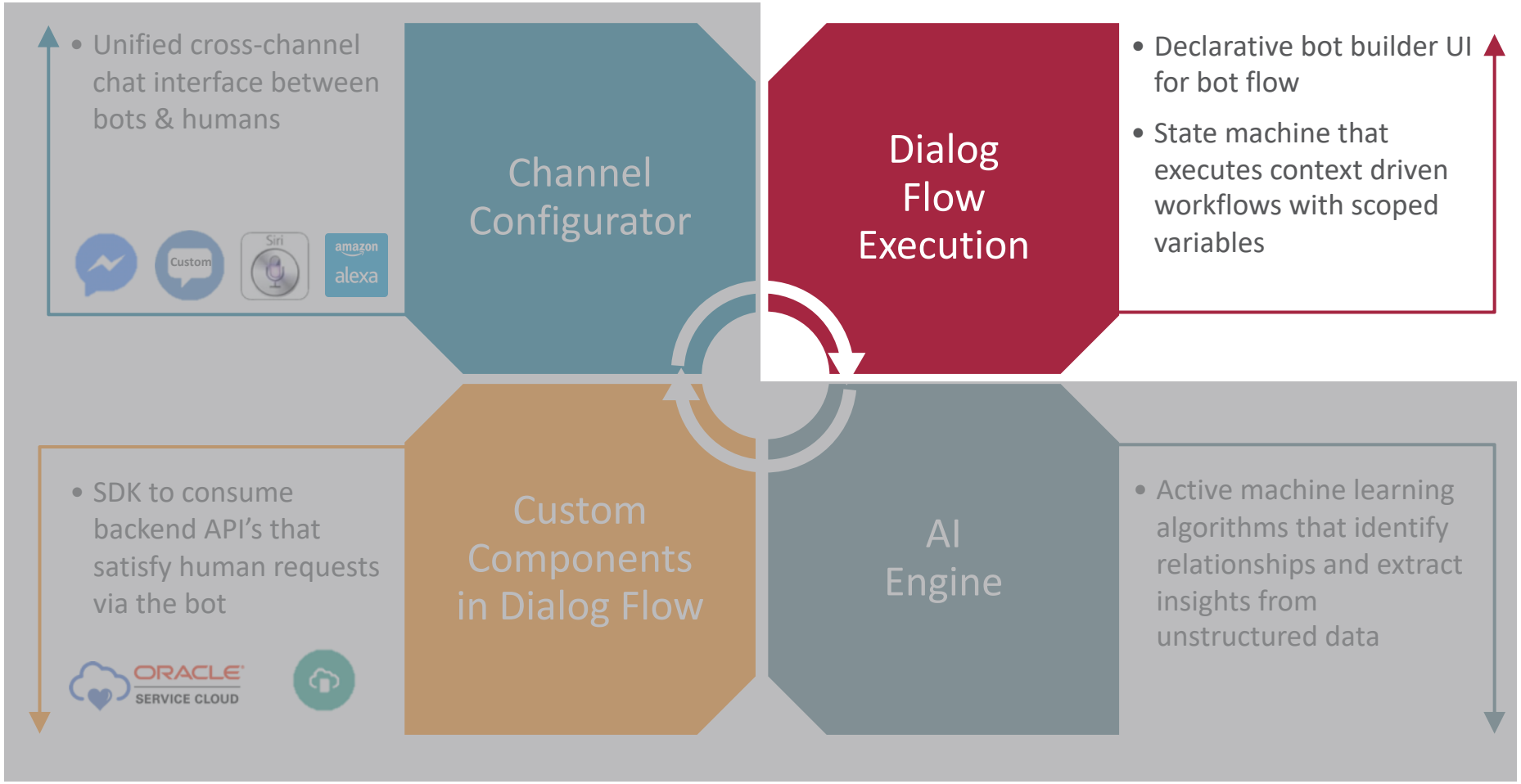
Intelligent chatbots: key components



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What are skills?

- Skills are ***individual chatbots*** designed to *fulfill specific tasks*, such as ordering food, making reservations, or changing contact information

- Each skill helps a user complete a task through a combination of text messages and simple UI elements like select lists

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The benefits of skills

- Each skill can focus exclusively on its own domain
  - Improves intent classification within each skill
  - Modularizes functions and enables incremental development
  - Simplifies versioning and lifecycle management
- Dramatically simplifies dialog flow development
  - Conversational Designers need not worry about (and design for) skill disambiguation
  - Built-in Digital Assistant skills reduces code in each individual skill
- Improves non-sequitur/off topic handling
- Enables segmented authorization

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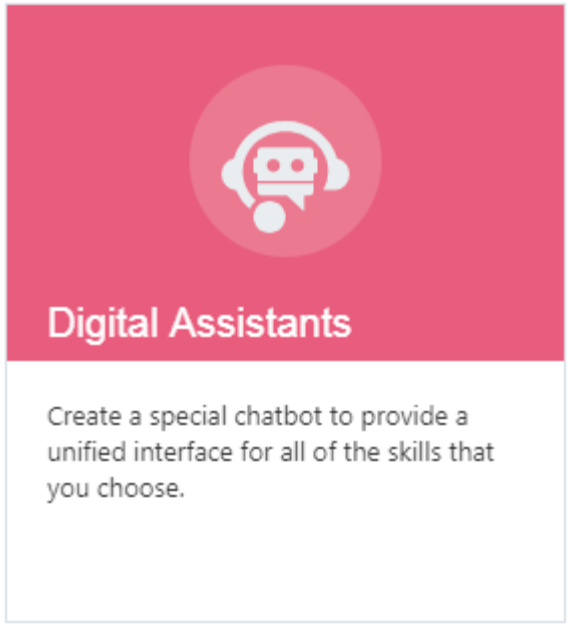
What is a digital assistant?

- An AI-driven collection of skills
- Advantages
  - Assemble based on developed skills or from skill store
  - Automatically matches user input to most appropriate skill
  - Greets the user on access
  - Upon request, lists what skills and use cases it supports
  - Handles interruptions to flows
  - Handles disambiguation
  - Explicit invocation
  - Exit and help requests



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What is routing?

- A key aspect of Oracle Digital Assistant
  - Enables richer, more human-like interactions
- A “conversational air traffic control”
  - Controls the overall “flow” of a conversation between and within skills
  - Necessary for the orchestration of skillbots

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Routing terminology

- Implicit routing
  - Routing based on content in input (user utterance)
  - DA routing rules decide which bot will handle input
  - Inputs are automatically disambiguated (via “Smart Dialogs”), if needed
- Explicit routing
  - Occurs when a skill name is explicitly stated in the user’s input
  - The dialog flow within the skill determines how the input is handled
- Candidate skills
  - Skills that have matching intents for a user input message
- Candidate flow
  - Intent in a skill bot matching the user input message
- System intent
  - Built-in DA intents (e.g., exit, help, unresolved)

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The digital assistant routing model – what it does

- The Digital Assistant evaluates each input (user utterance) to determine "where it belongs" and thus decides how to respond
- The options for routing an input are:
  - To a built-in Digital Assistant intent
  - To a new skill
  - To a different intent (state) within the current skill

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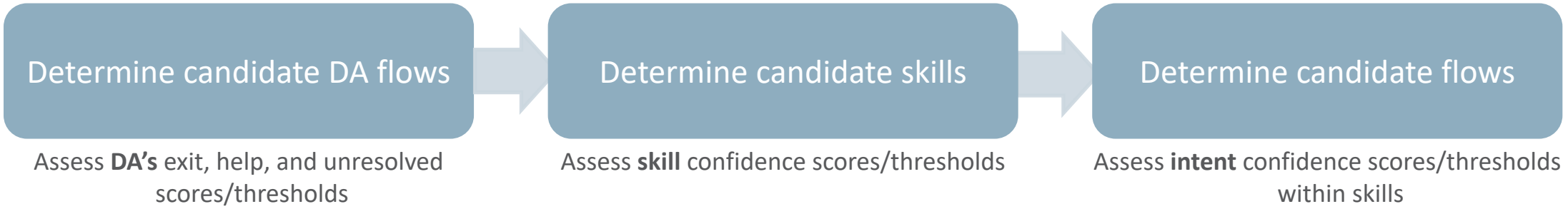
The base routing model layers



- ***NOTE**: There are special cases that impact the base routing model. (We'll cover them shortly)*

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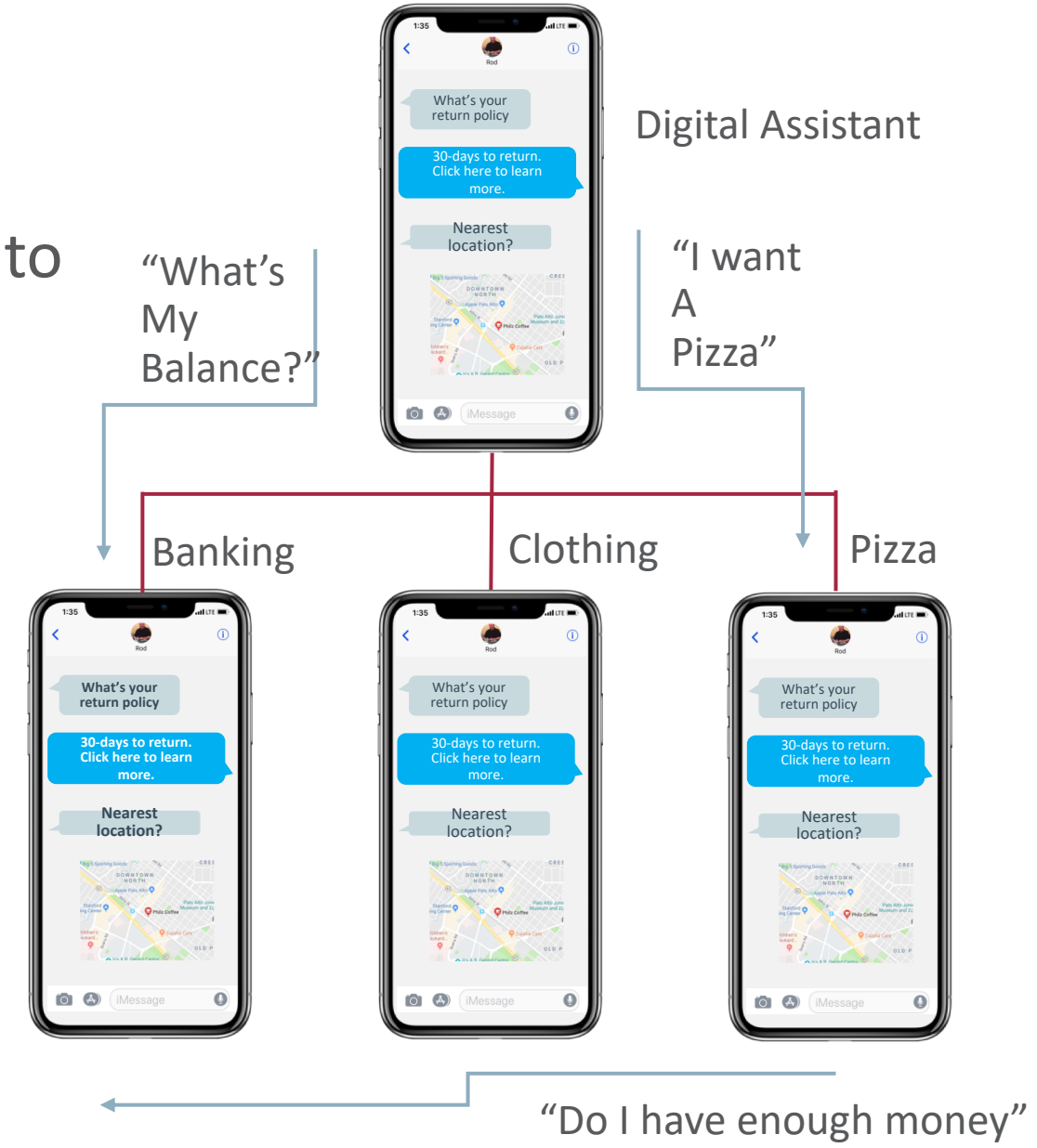
Skill routing example

- Digital Assistant routes requests to the correct skill bots



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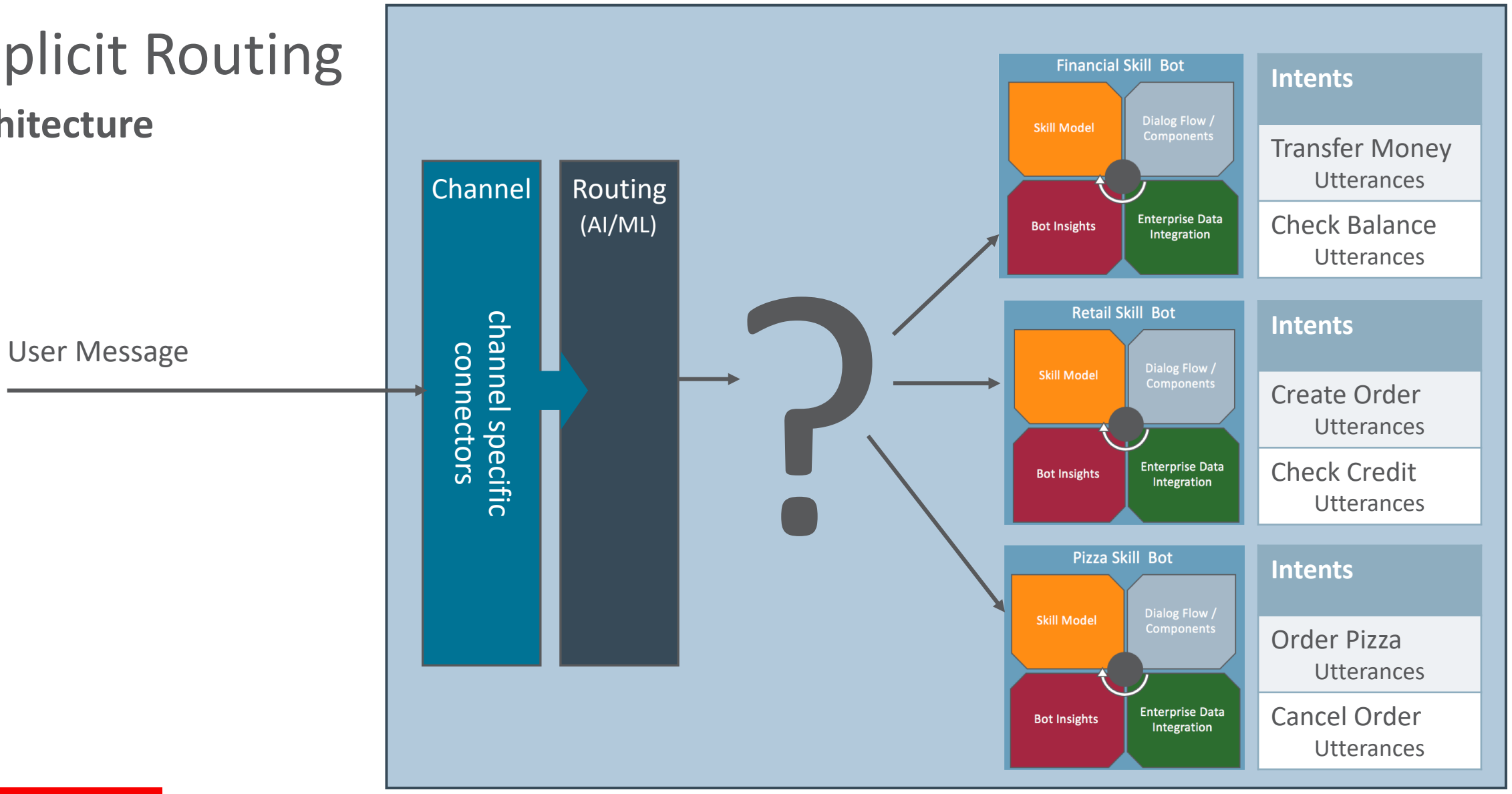
Implicit Routing

Architecture



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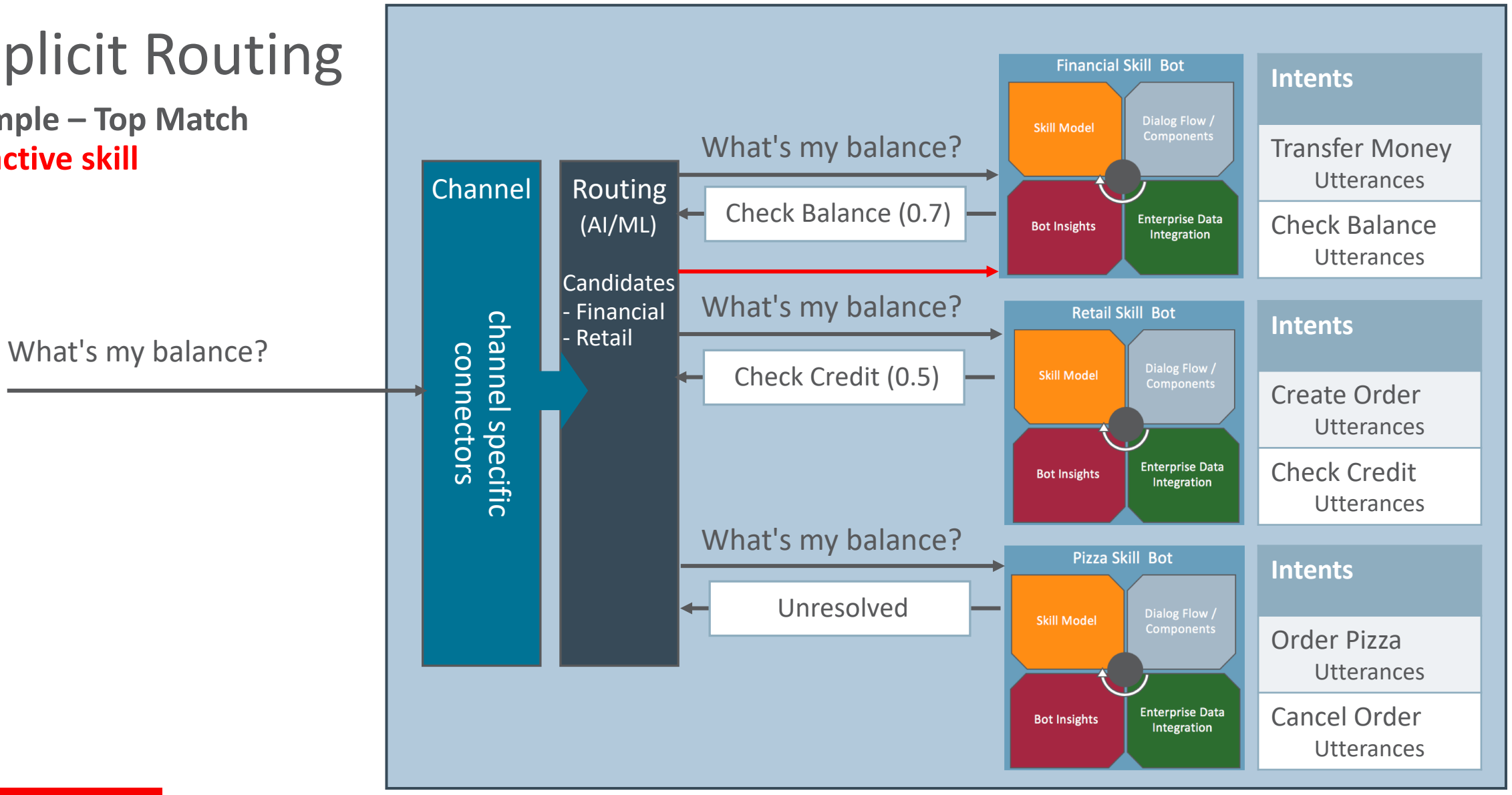
Implicit Routing

Example – Top Match

No active skill



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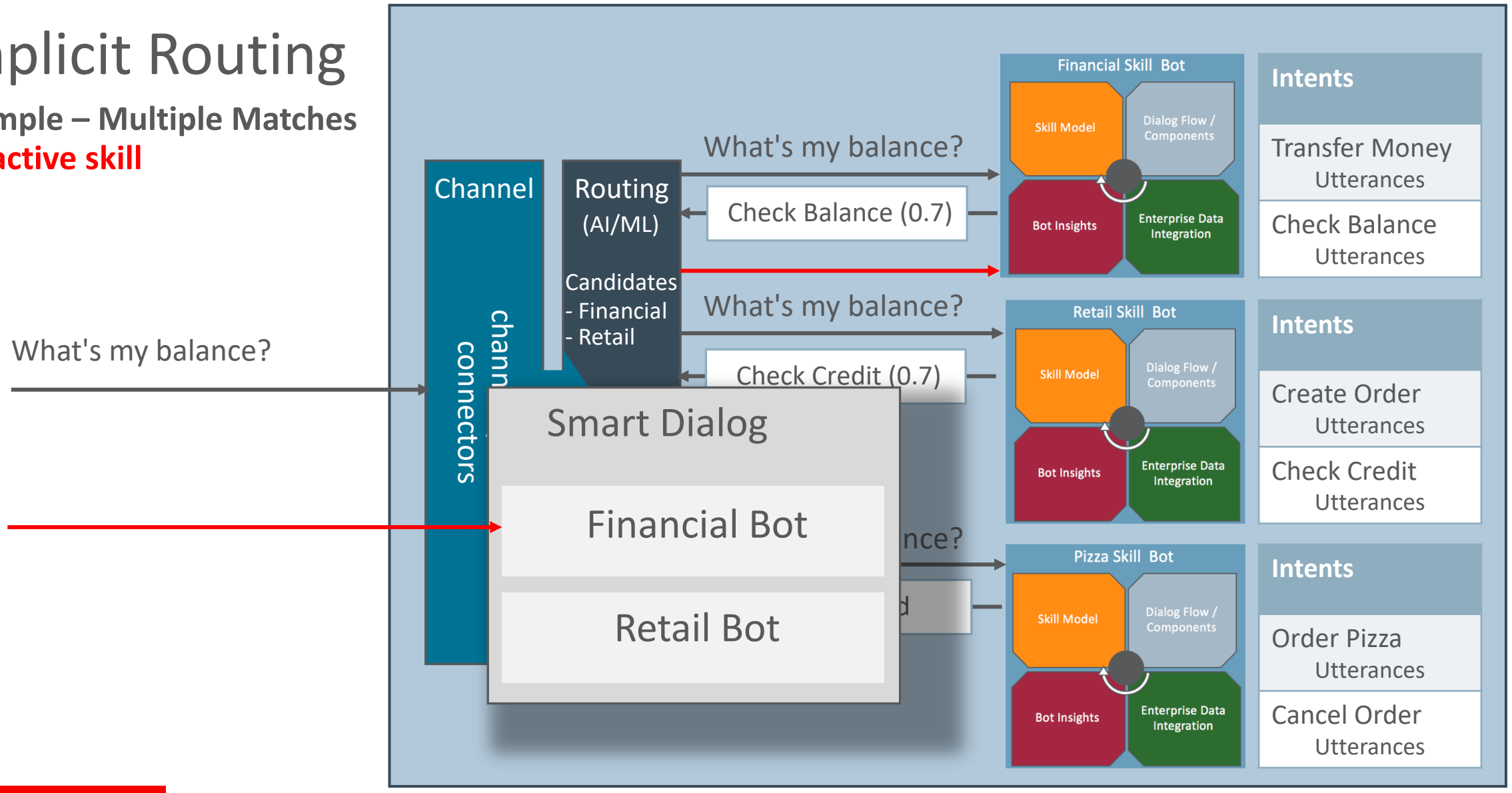
Implicit Routing

Example – Multiple Matches

No active skill



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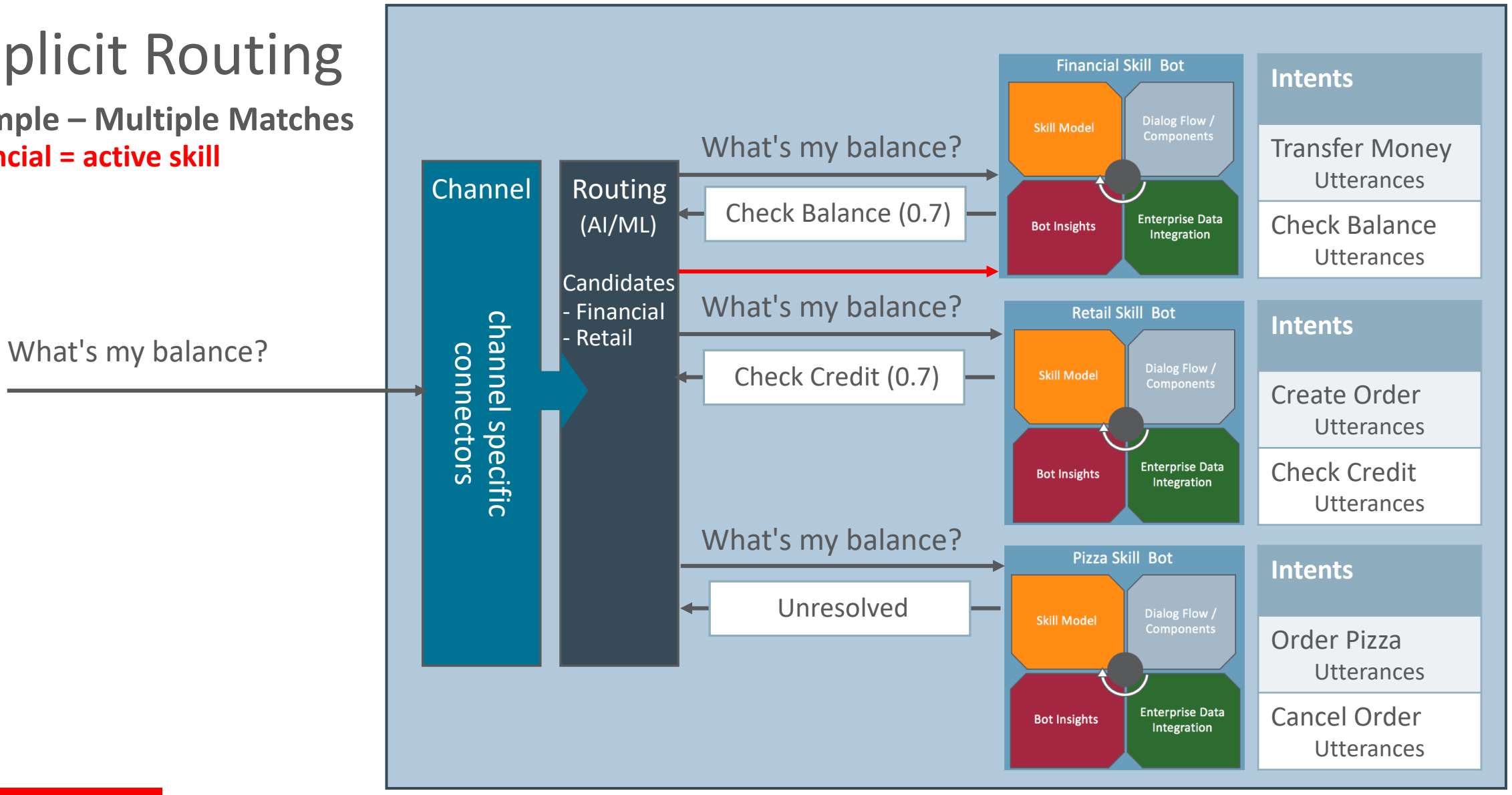
Implicit Routing

Example – Multiple Matches

Financial = active skill



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Explicit invocation patterns

- [Phrase] + skill bot name + [utterance]
  - Pizzajoe
  - Ask pizzajoe when my pizza will be delivered
  - Pizzajoe ,I want to order a pizza

- [Utterance] + skill bot name
  - Order a pizza from pizzajoe
  - Can I place an order with pizzajoe?

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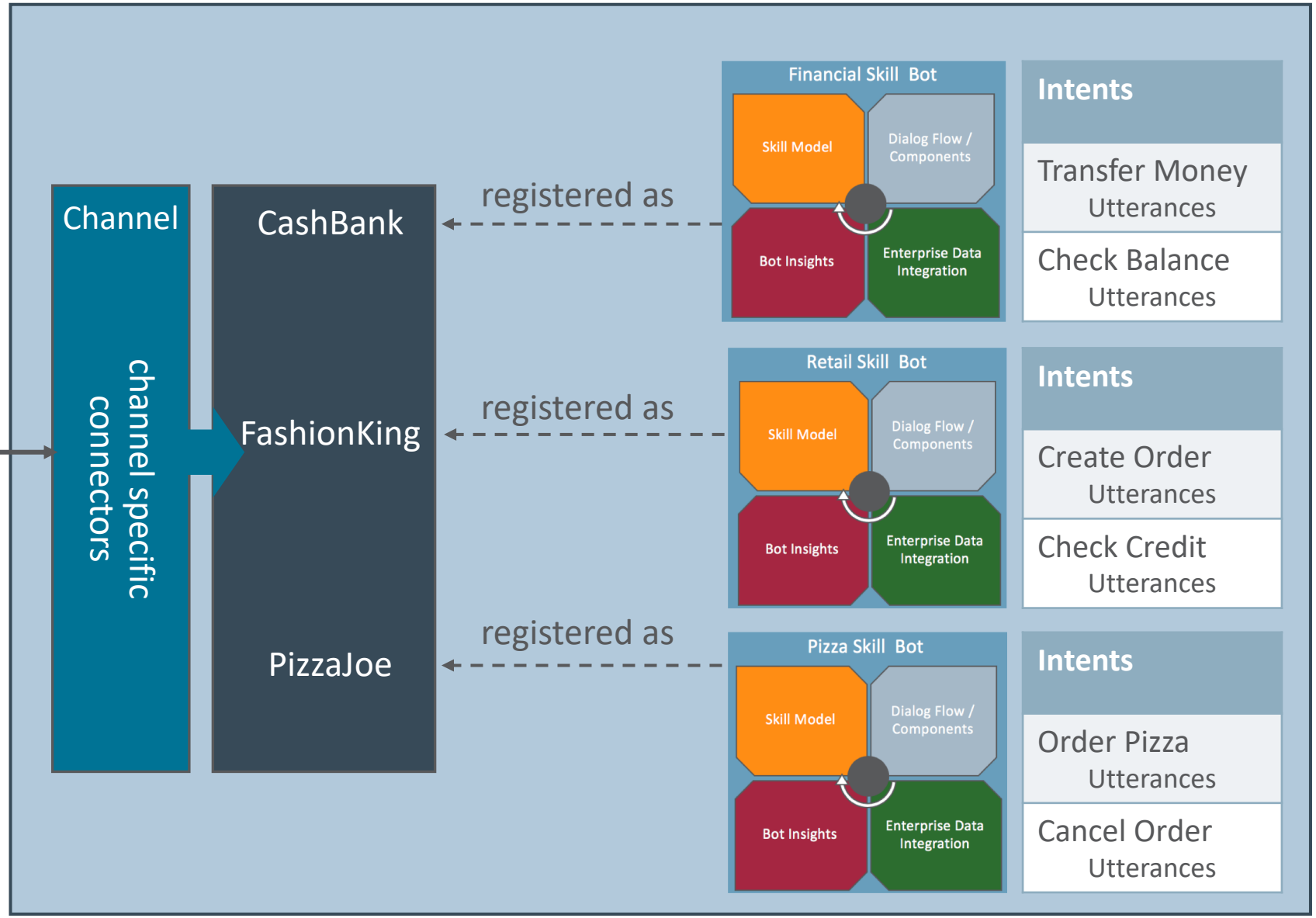
Explicit routing

Architecture

User Message
<addressing> <utterance>



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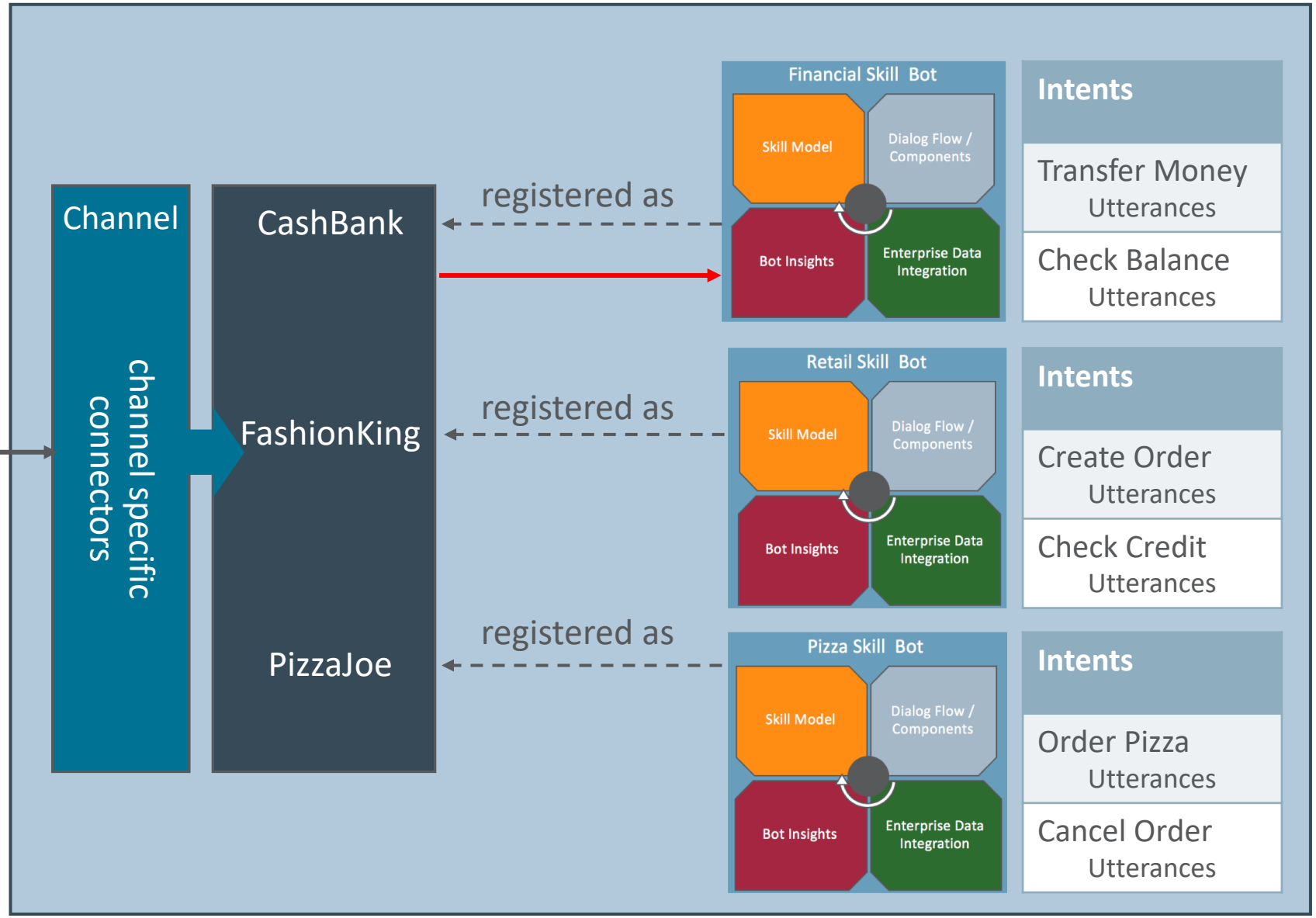
Explicit routing

Example

Ask **CashBank** to check my balance



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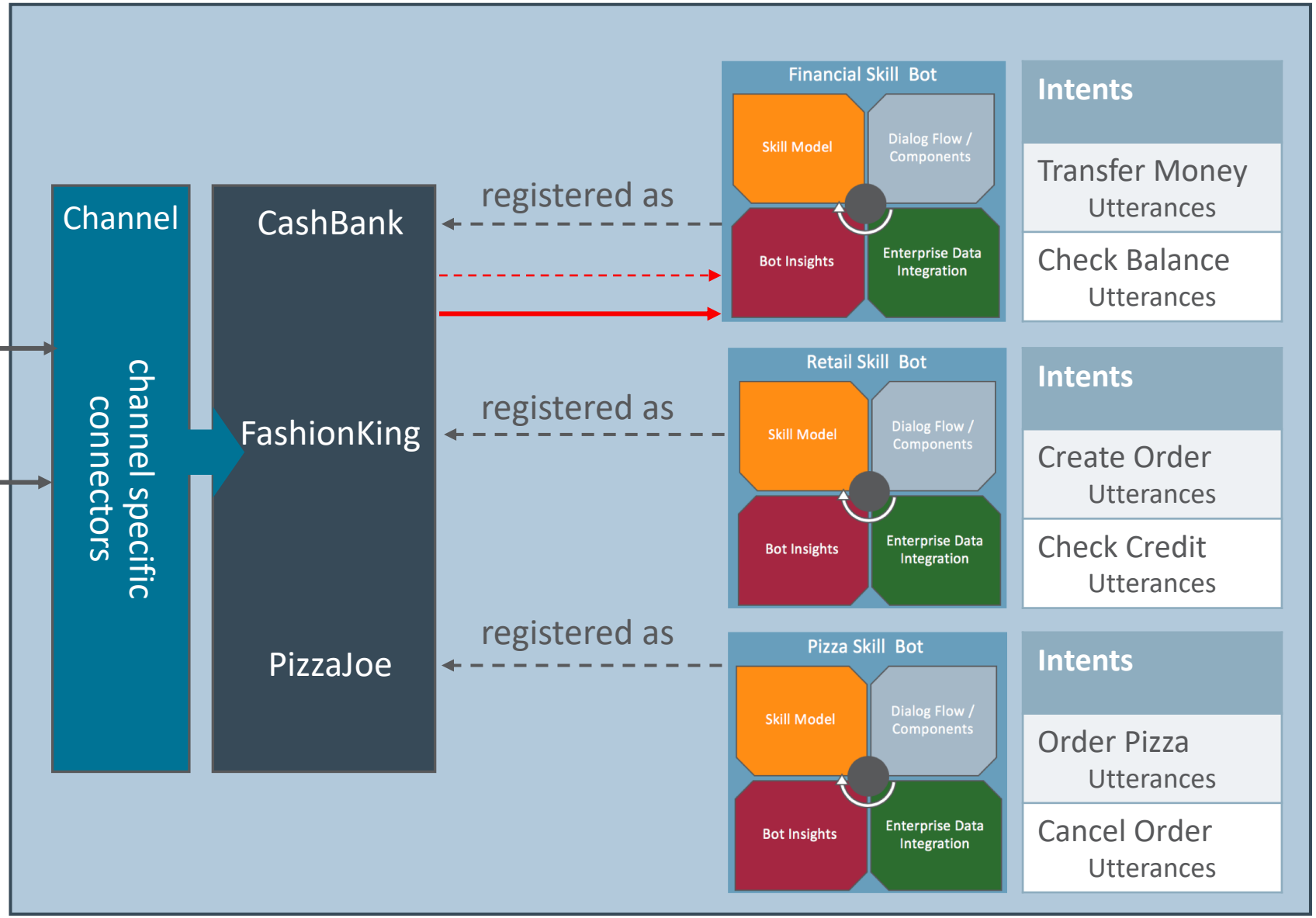
Explicit routing

Example



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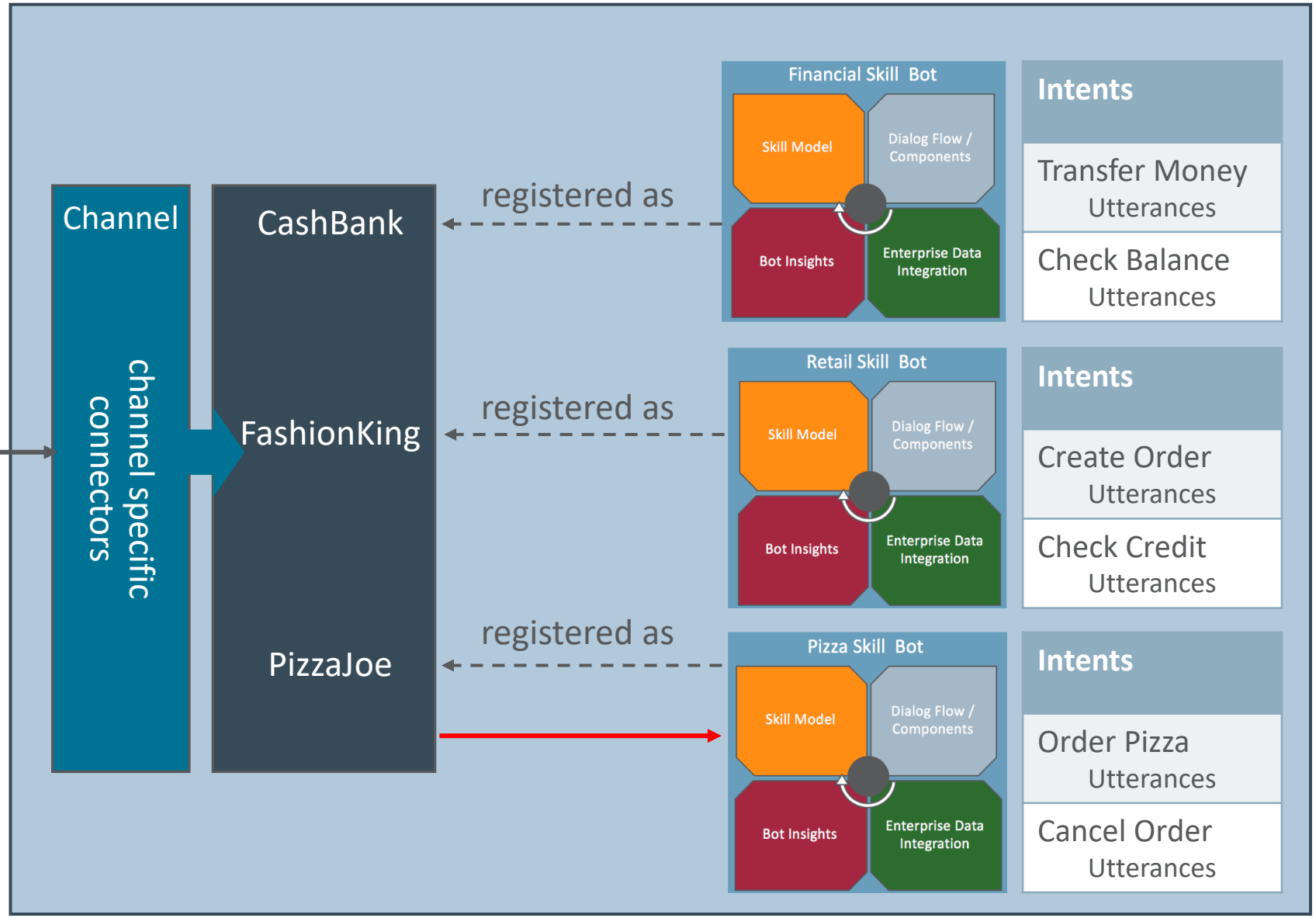
Explicit routing

Example

PizzaJoe, I want to order food



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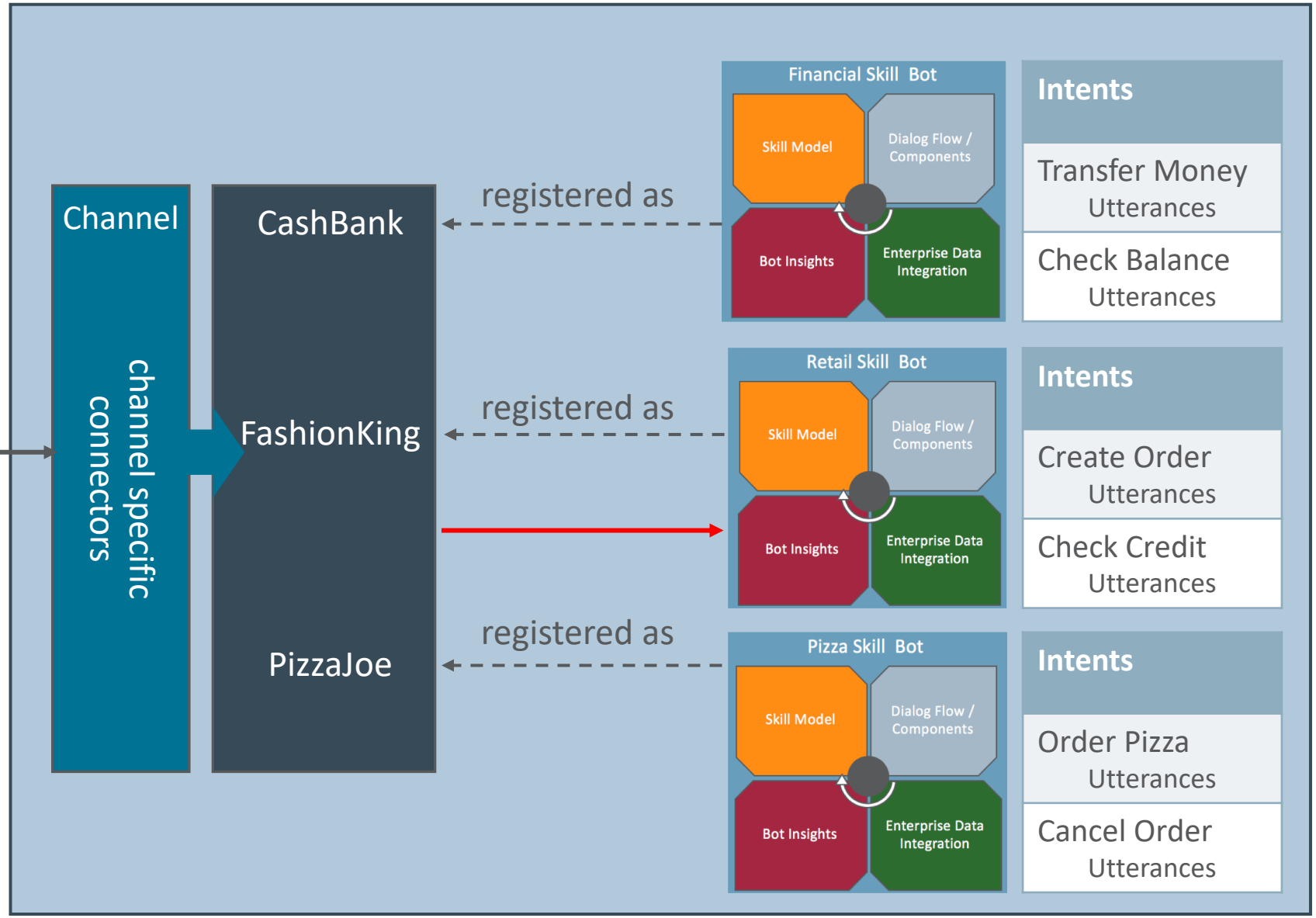
Explicit routing

Example

check **FashionKing,** how much money do I have?



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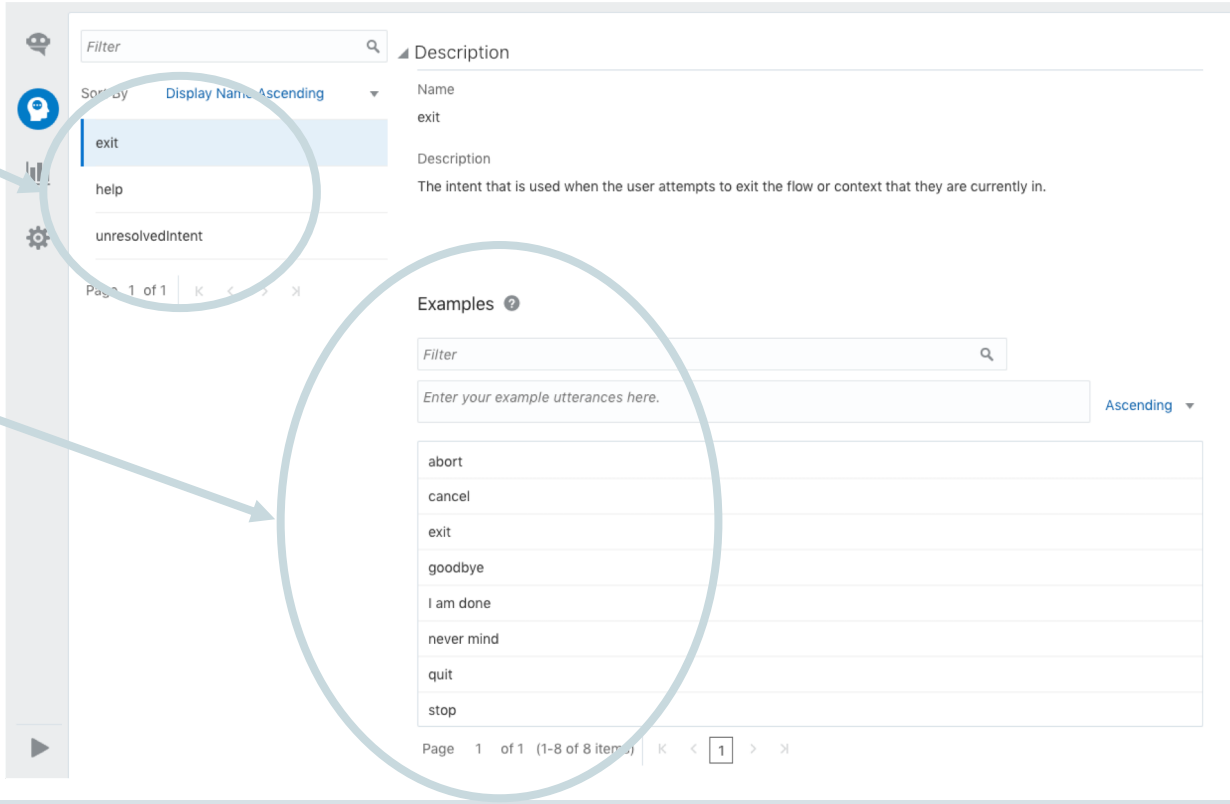
Built-in Digital Assistant intents

- Wouldn’t it be good if DA could globally handle common use cases?
- The DA has *built-in intents* to control the behavior for the following:
  - Exit
  - Help
  - Unresolved
- Each intent may be trained to suit specific needs



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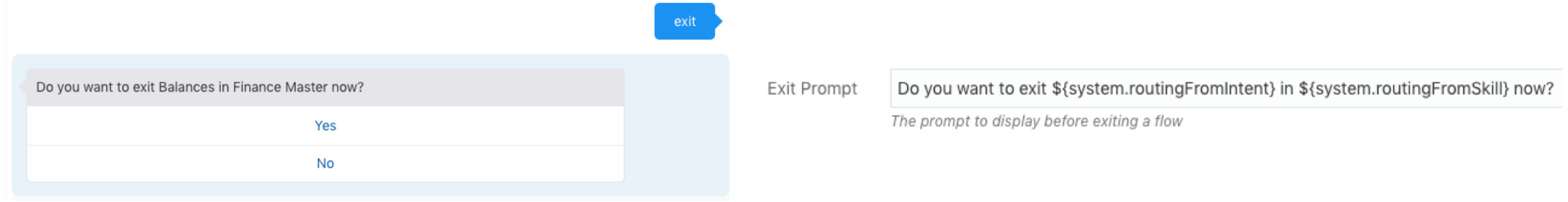
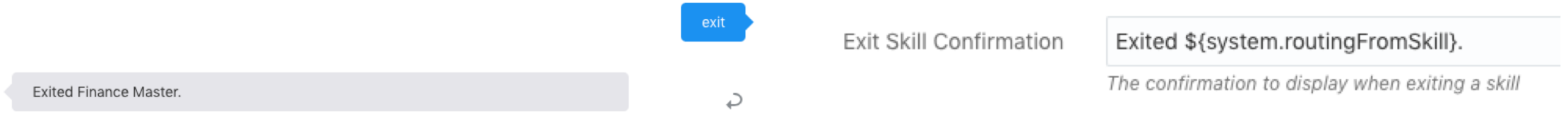
Built-in skills – exit

- Exit state applies when the intent engine determines user asking to exit
- If in a flow, DA will ask to confirm exit (via the “Exit Prompt” setting)



- If not in a flow, DA will confirm once it has exited (via the “Exit Skill Confirmation” setting)



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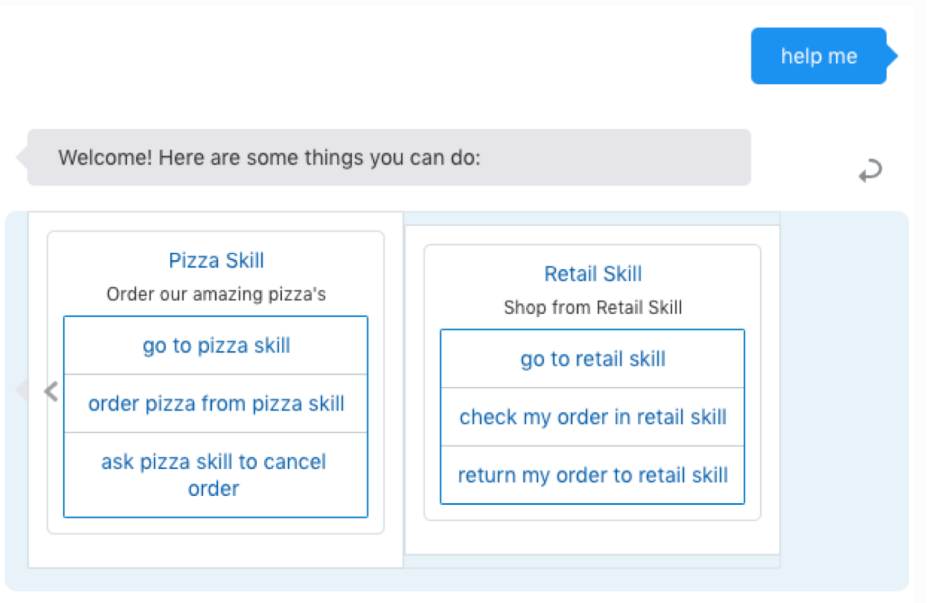
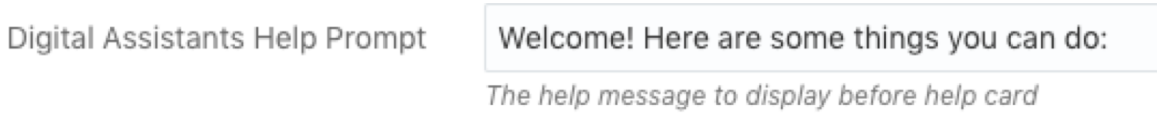
Built-in skills – help (user not in skill)

- Help state applies when the intent engine determines user asking for help
- When not in a flow/skill, the digital assistant will DA will offer a help prompt and a carousel of available skills





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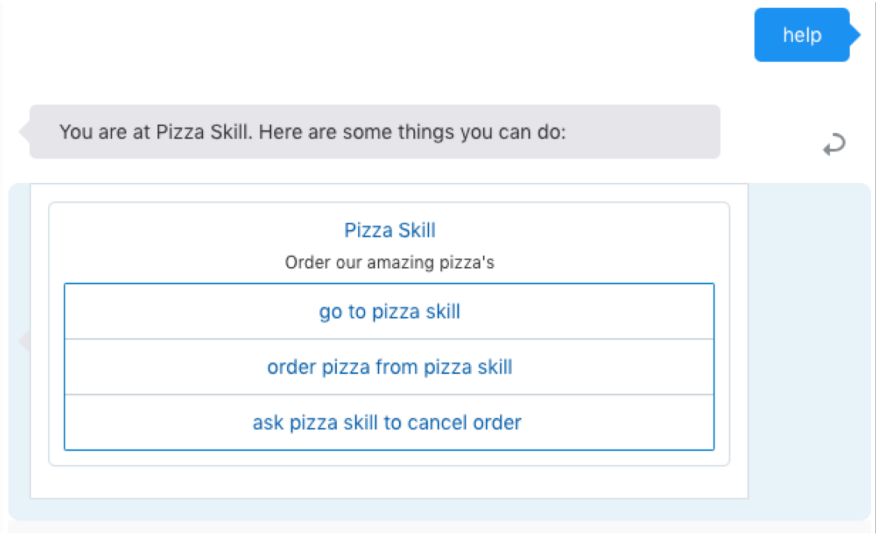
Built-in skills – help (user in skill)

- Help state applies when the intent engine determines user asking for help
- When in a flow/skill, the DA will first try to route to the skill's help state (as specified in the skill's configuration)
- If no help state has been defined at the skill level, the DA displays a prompt and a card



Skill Bot Help Prompt

You are at ${system.routingFromSkill}. Here are some things you can do:

The help message to display for a skill bot above its help card

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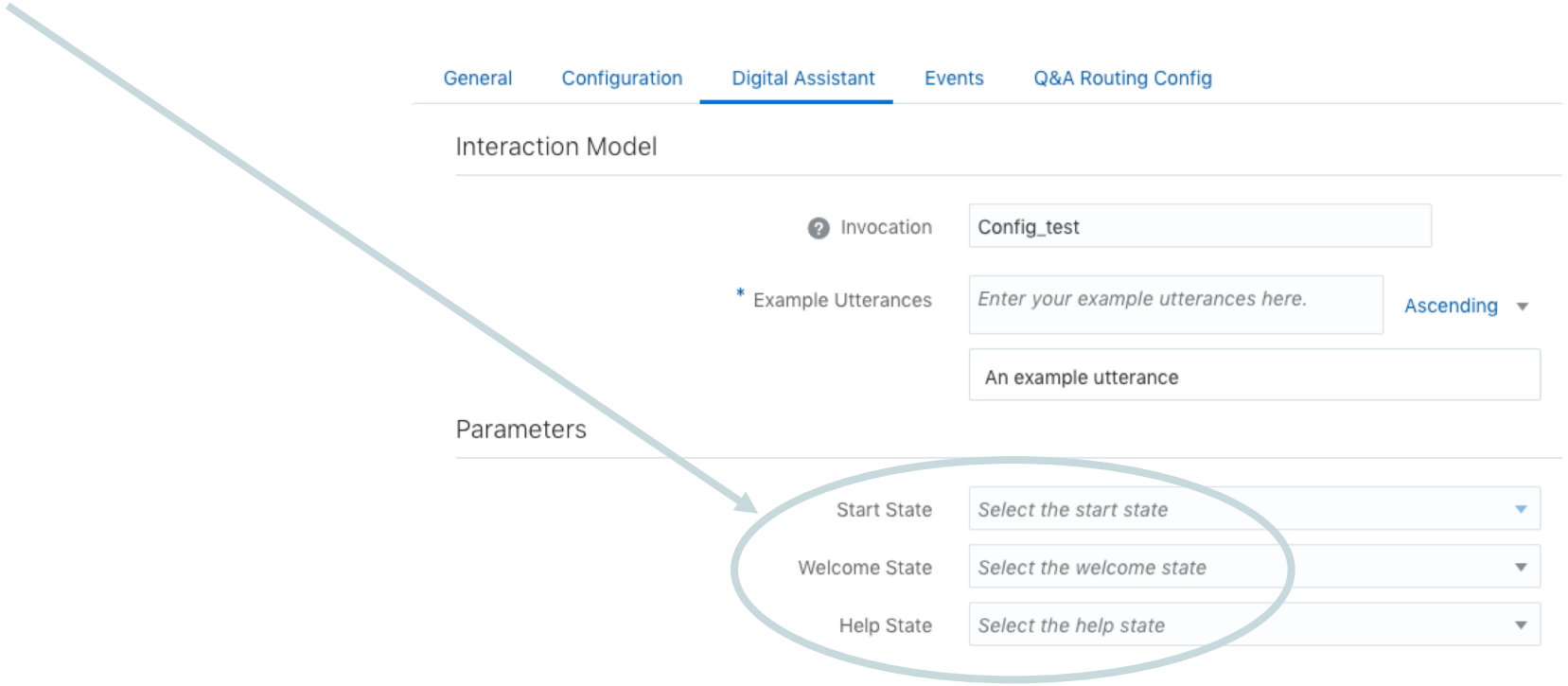
Skill-level settings and DA default responses

- Individual skills may contain specific Start, Welcome, and Help states
  - Skill-level settings determine which state in a skill's dialog flow handles each state



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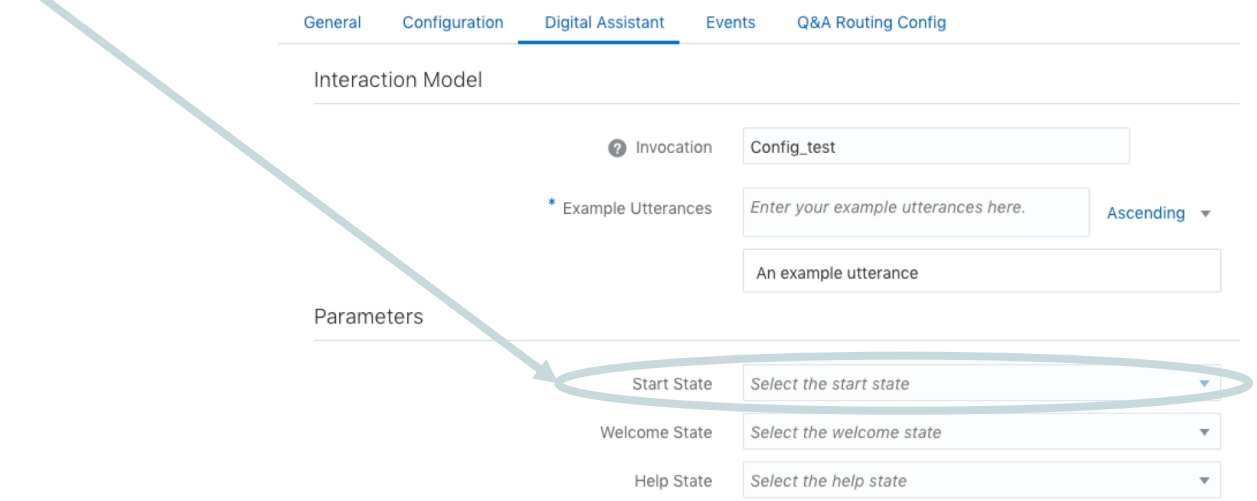
Default responses - start

- The Start state occurs when the intent engine determines that the user wants to start using a given skill
  - Generally when the user expresses an intent that is related to a skill
- If a start state hasn't been specified in the skill, the DA invokes the first state in the skill (typically the System.Intent component)



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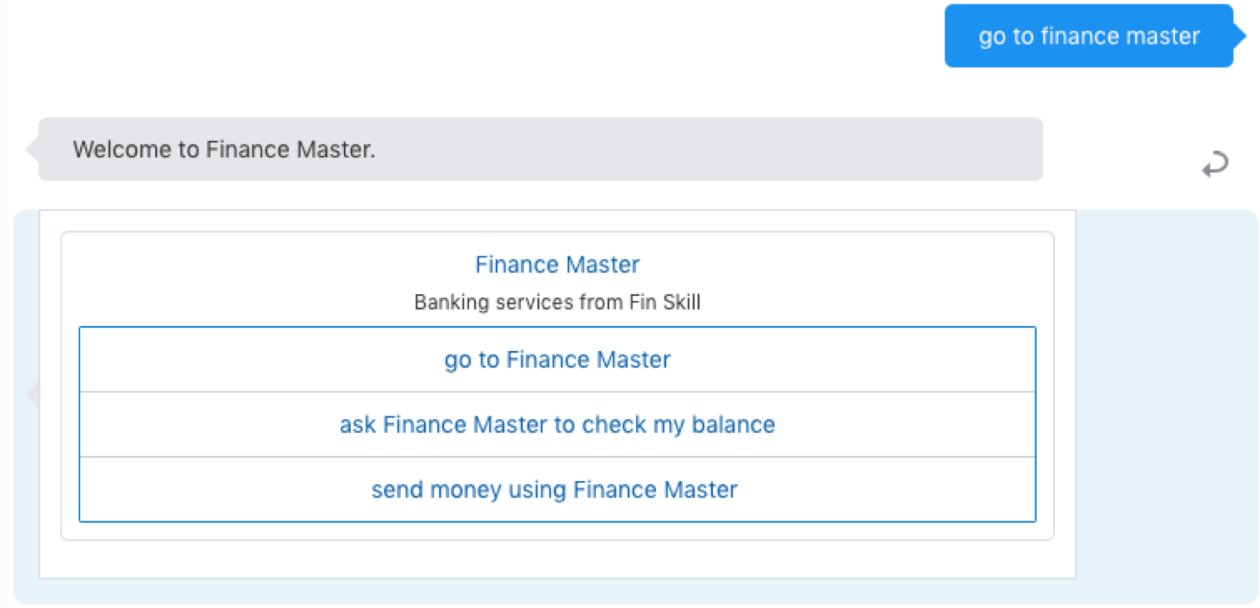
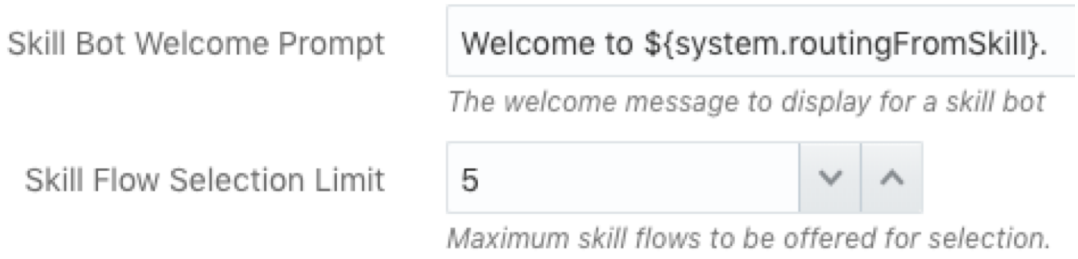
Default responses - welcome

- Welcome applies when user enters the invocation name without an intent.
- If a welcome state is not defined for a skill, DA provides one automatically.
  - Default welcome is a prompt and card showing the skill's display name, one-sentence description, and a few of its sample utterances.





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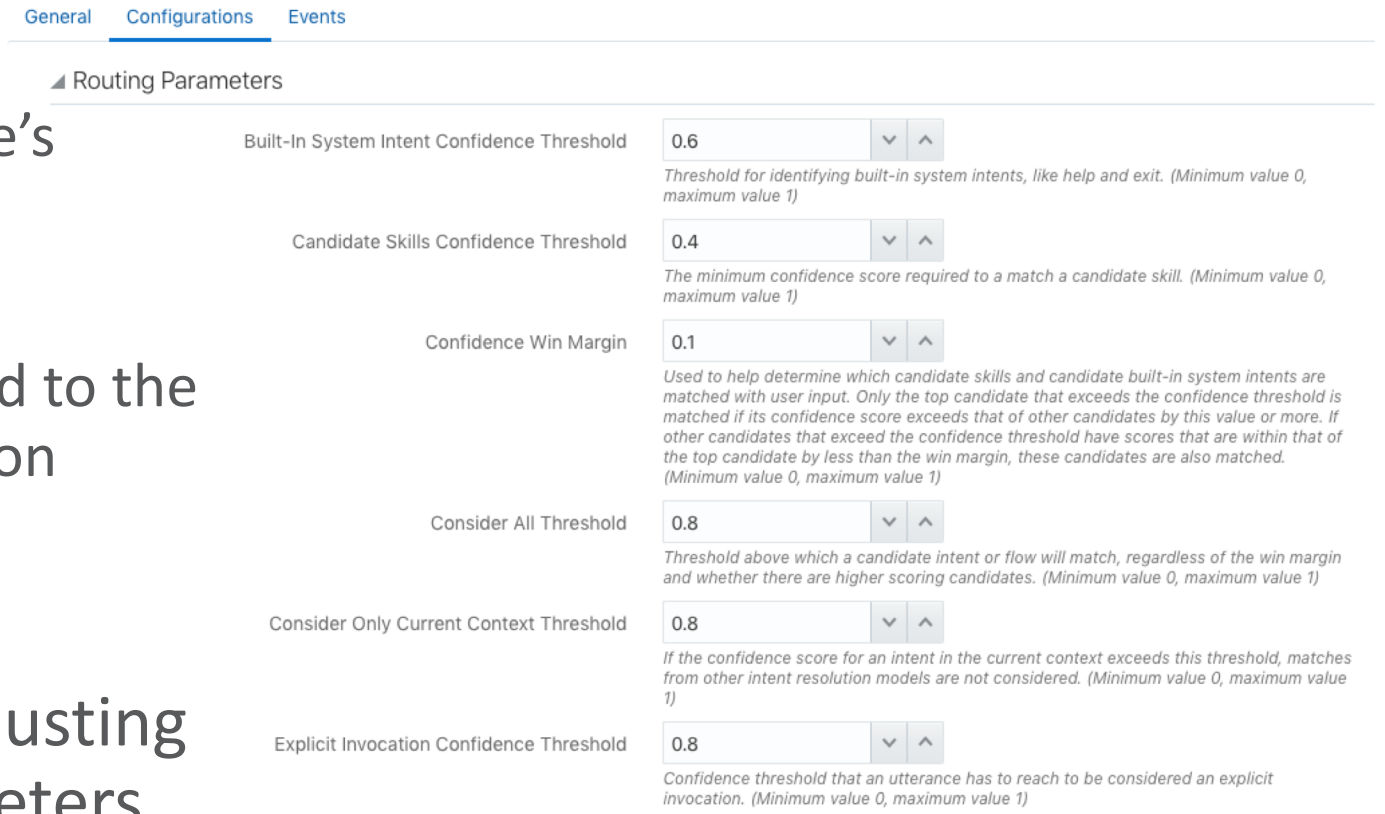
DA routing configurations overview

- Important terminology:
  - *Confidence level* is the intent engine's "score" for utterance classification
  - Range is 0 – 1.0
  - *Threshold* is a value that's compared to the confidence level to define next action
  - *Margin* is the difference between confidence levels
- Routing behavior is tuned by adjusting the thresholds of routing parameters



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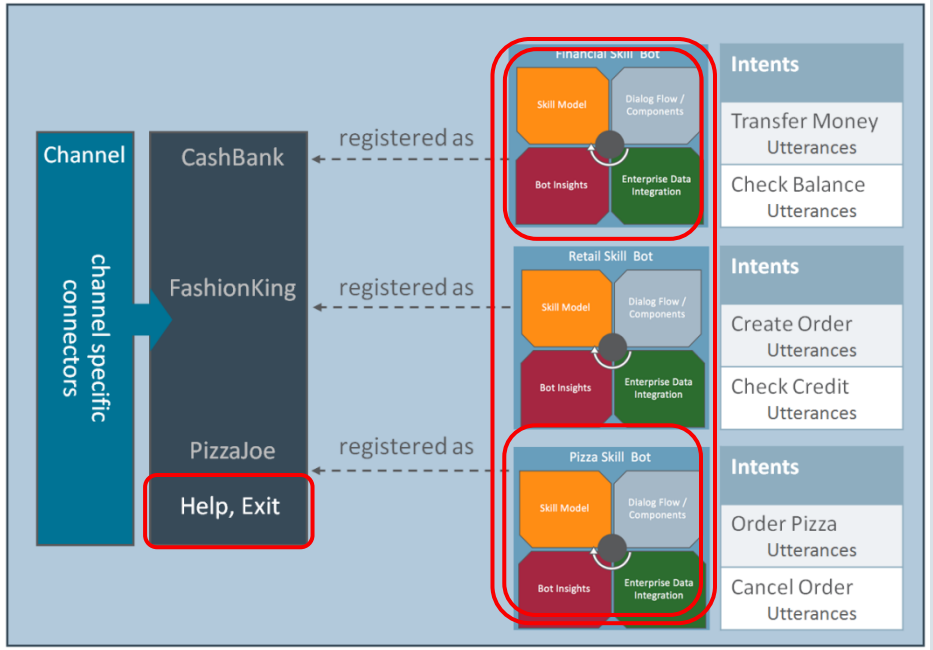
DA routing configuration details

- Built-In System Intent Confidence Threshold
  - Threshold for identifying built-in system intents (e.g. help and exit)
- Candidate Skills Confidence Threshold
  - The minimum confidence score required to a match a candidate skill
- Confidence Win Margin
  - If a candidate's confidence score exceeds that of other candidates by this value or more, it will be matched



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Dealing with unresolvedIntent

- unresolvedIntent is a good practice to aid successful intent resolution
  - Each skill should have one defined
  - unresolvedIntent on DA level only helps disambiguate exit and help
- You don’t want user being told unresolvedIntent is an option
  - unresolvedIntent is the only intent we “hide” in smart dialog
  - If skill is already active, dealt with by that skills System.Intent unresolvedIntent

```
states:
  getIntent:
    component: "System.Intent"
    properties:
      variable: "userInput"
    transitions:
      actions:
        TransferMoney: "startMoneyTransfer"
        Balance: "startBalance"
        TrackSpending: "startTrackSpending"
        unresolvedIntent: "handleUnresolved"
```

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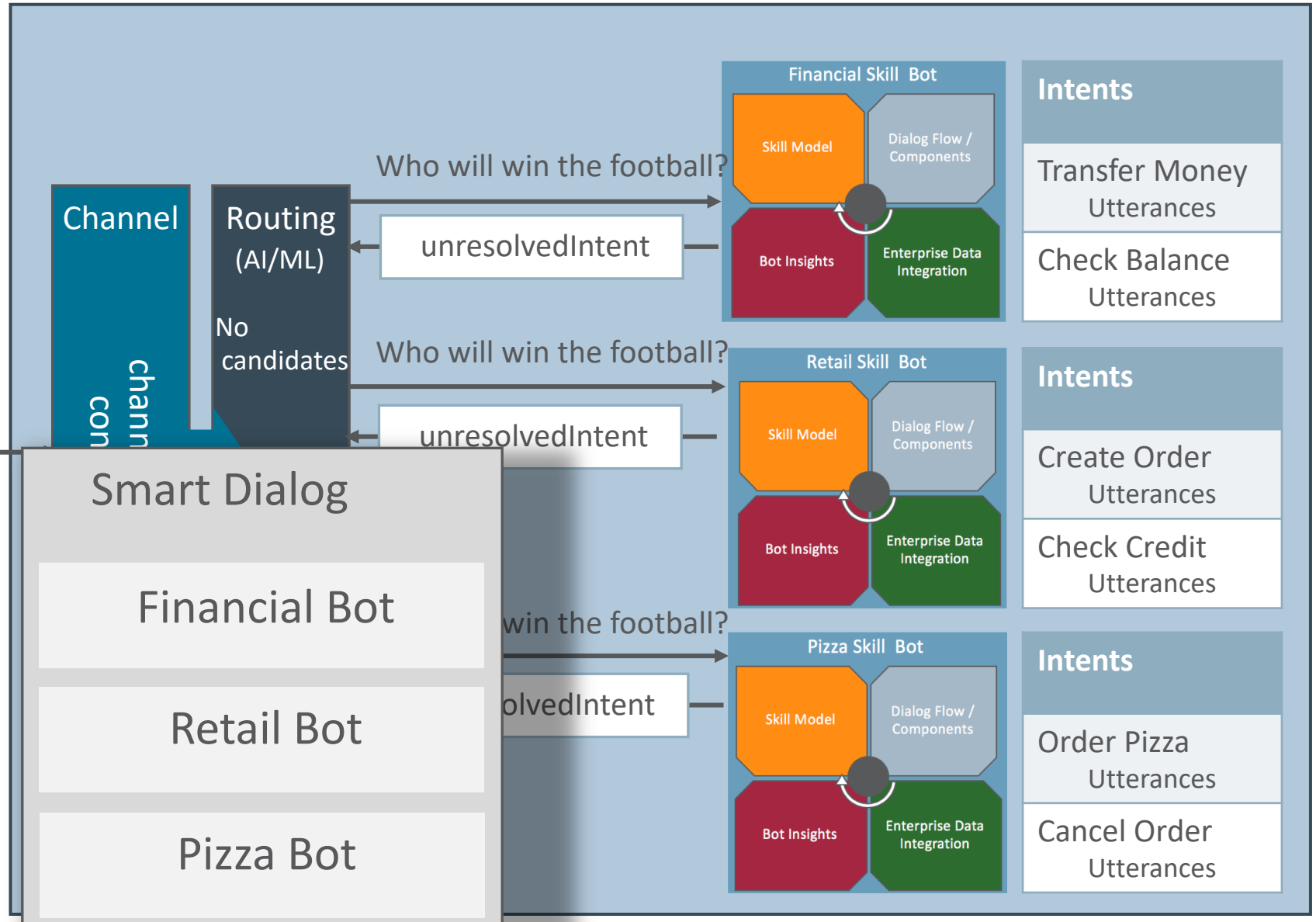
Example – unresolvedIntent
No active skill



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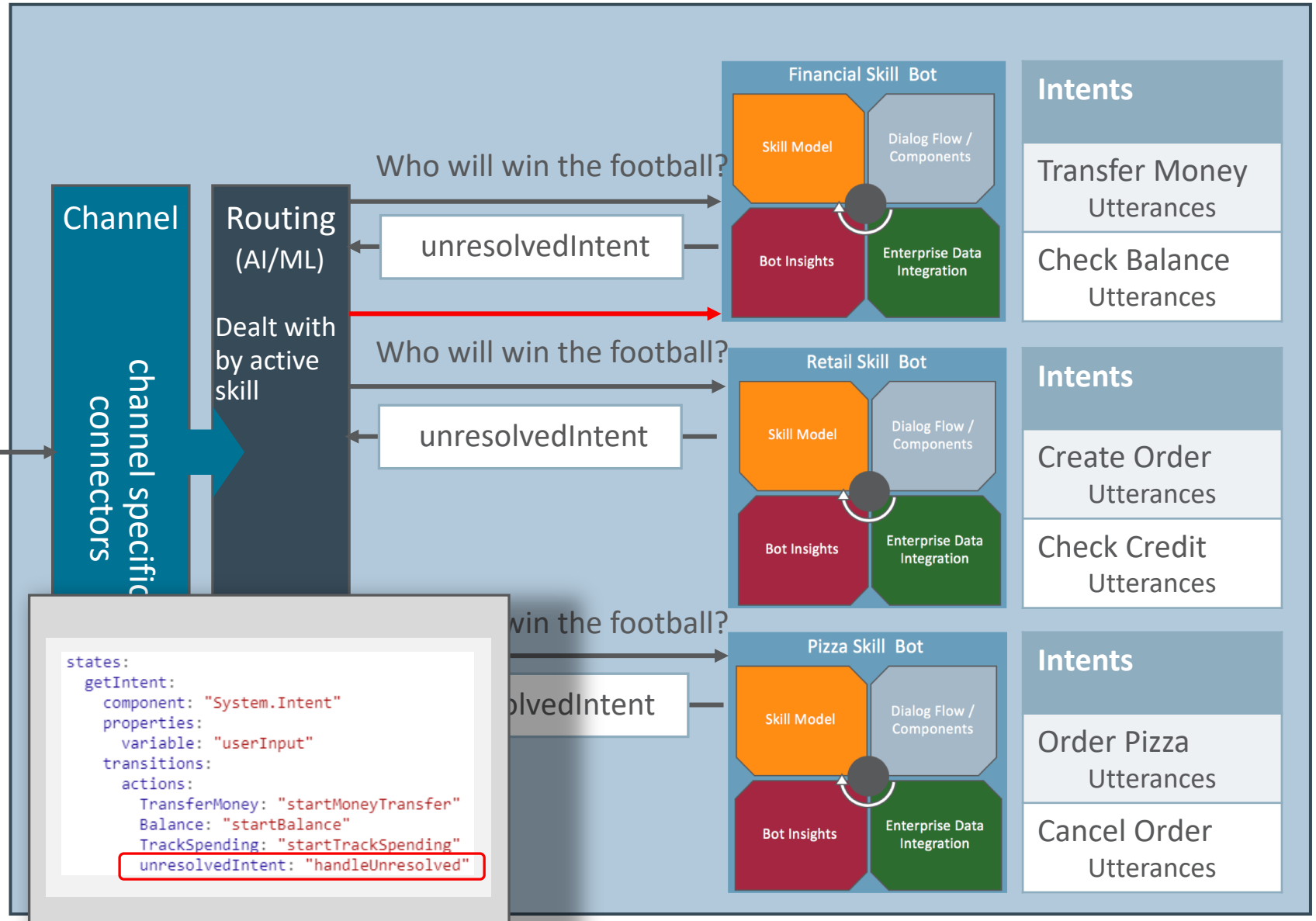
Example – unresolvedIntent

Financial = active skill



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