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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CHANDRASHEKHAR G. DESHPANDE, SHANKAR S. KALYANA, JIGNESHKUMAR K. KARIA, and GANDHI SIVAKUMAR

Appeal 2019-003793
Application 14/323,607
Technology Center 2400

Before JOHN A. JEFFERY, ST. JOHN COURTENAY III, and JASON J. CHUNG, *Administrative Patent Judges*.

JEFFERY, *Administrative Patent Judge*.

DECISION ON APPEAL

Under 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1, 4–7, 10–13, and 16–21. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as International Business Machines Corporation. Appeal Br. 1.

STATEMENT OF THE CASE

Appellant's invention synchronizes clocks in cloud computing. To this end, a virtualized computing cloud with a centralized clock is partitioned into multiple virtualized logical server clouds. Different types of clocks are then selected and implemented in each cloud, and the centralized clock is disabled such the each virtualized logical server cloud is synchronized only to its respective clock type. This arrangement solves the problems associated with the previous "one clock type fits all" approach, especially when a centralized clock is not the best clock to synchronize a particular server cloud. *See generally* Abstract; Spec. 5–7; Fig. 2. Claim 1 is illustrative:

> 1. A method of clock synchronization in cloud computing comprising:
>
> providing a plurality of physical computer assets including at least one physical server having a central processing unit;
>
> linking the plurality of physical computer assets together to form a virtualized computing cloud, the virtualized computing cloud having a centralized clock for coordinating the operation of the virtualized computing cloud;
>
> logically partitioning the virtualized computing cloud into a plurality of virtualized logical server clouds, each of the virtualized logical server clouds having a local clock synchronized to the centralized clock of the virtualized computing cloud;
>
> selecting a first clock type from a clock protocol palette associated with the virtualized computing cloud for a first virtualized logical server cloud, the clock protocol palette having a plurality of different clock protocol types, wherein the first clock type selected is a suitable clock for synchronization of the first virtualized logical server cloud;

selecting a second clock type from the clock protocol palette associated with the virtualized computing cloud for a second virtualized logical server cloud such that the first clock type and the second clock type are different clock types, wherein the second clock type selected is a suitable clock for synchronization of the second virtualized logical server cloud;

implementing the first clock type in the first virtualized logical server cloud such that the first clock type is synchronized to the first virtualized logical server cloud;

implementing the second clock type in the second virtualized logical server cloud such that the second clock type is synchronized to the second virtualized logical server cloud, the second clock type being implemented in the second virtualized logical server cloud at the same time as the first clock type being implemented in the first virtualized logical server cloud; and

disabling the centralized clock in the first and second virtualized logical server clouds so that the first virtualized logical server cloud is synchronized only to the first clock type and the second virtualized logical server cloud is synchronized only to the second clock type;

wherein the method is performed on one or more computing devices.

THE REJECTIONS

The Examiner rejected claims 1, 6, 7, 12, 13, and 18–21 under 35 U.S.C. § 103 as unpatentable over Appellant's Admitted Prior Art in Deshpande (US 2016/0006804 Al; published Jan. 7, 2016) ("APA"), Josh Matson, *Choosing the Correct Time Synchronization Protocol and Incorporating the 1756-TIME Module in Your Application*, Pub. ENET-WP030A-EN-E, Rockwell Automation, Inc. (2013) ("Matson"), and

Zampetti (US 2008/0049743 Al; published Feb. 28, 2008). Final Act. 2–7, 10–15.[2,3]

The Examiner rejected claims 4, 5, 10, 11, 16, and 17 under 35 U.S.C. § 103 as unpatentable over APA, Matson, Zampetti, and Sinha (US 2015/0350101 Al; published Dec. 3, 2015). Final Act. 7–9.

The Examiner rejected claims 4, 10, and 16 under 35 U.S.C. § 103 as unpatentable over APA, Matson, Zampetti, and Huang (US 2015/0058486 Al; published Feb. 26, 2015). Final Act. 15–16.

The Examiner rejected claims 5, 11, and 17 under 35 U.S.C. § 103 as unpatentable over APA, Matson, Zampetti, and Muller (US 2014/0165060 Al; published June 12, 2014). Final Act. 16–17.

The Examiner rejected claims 1, 6, 7, 12, 13, and 18–21 under 35 U.S.C. § 103 as unpatentable over APA and Lawson (US 2013/0212420 Al; published Aug. 15, 2013). Final Act. 18–22.

The Examiner rejected claims 4, 10, and 16 under 35 U.S.C. § 103 as unpatentable over APA, Lawson, and Huang. Final Act. 22–23.

The Examiner rejected claims 5, 11, and 17 under 35 U.S.C. § 103 as unpatentable over APA, Lawson, and Muller. Final Act. 23–24.

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[2] Throughout this opinion, we refer to (1) the Final Rejection mailed March 28, 2018 ("Final Act."); (2) the Appeal Brief filed August 27, 2018 ("Appeal Br."); (3) the Examiner's Answer mailed February 15, 2019 ("Ans."); and (4) the Reply Brief filed April 12, 2019 ("Reply Br.").

[3] The Examiner rejected claims 1, 6, 7, 12, 13, and 18–21 over APA, Matson, and Zampetti twice in connection with different sets of rejections. *See* Final Act. 2–7 (first rejection set), 10–15 (second rejection set).

The Examiner rejected claims 1, 6, 7, 12, 13, and 18–21 under 35 U.S.C. § 103 as unpatentable over APA and Chaffee (US 2006/0109376 Al; published May 25, 2006). Final Act. 25–28.

The Examiner rejected claims 4, 10, and 16 under 35 U.S.C. § 103 as unpatentable over APA, Chaffee, and Huang. Final Act. 28–30.

The Examiner rejected claims 5, 11, and 17 under 35 U.S.C. § 103 as unpatentable over APA, Chaffee, and Muller. Final Act. 30–31.

The Examiner rejected claims 1, 6, 7, 12, 13, and 18–21 under 35 U.S.C. § 103 as unpatentable over APA and Chen (US 2012/0042047 Al; published Feb. 16, 2012). Final Act. 32–35.

The Examiner rejected claims 4, 10, and 16 under 35 U.S.C. § 103 as unpatentable over APA, Chen, and Huang. Final Act. 35–36.

The Examiner rejected claims 5, 11, and 17 under 35 U.S.C. § 103 as unpatentable over APA, Chen, and Muller. Final Act. 36–37.

The Examiner rejected claims 1, 6, 7, 12, 13, and 18–21 under 35 U.S.C. § 103 as unpatentable over APA and Frels (US 2014/0122915 Al; published May 1, 2014). Final Act. 38–41.

The Examiner rejected claims 4, 10, and 16 under 35 U.S.C. § 103 as unpatentable over APA, Frels, and Huang. Final Act. 41–42.

The Examiner rejected claims 5, 11, and 17 under 35 U.S.C. § 103 as unpatentable over APA, Frels, and Muller. Final Act. 43–44.

THE FIRST REJECTION OVER APA, MATSON, AND ZAMPETTI ("FIRST REJECTION SET")[4]

Regarding independent claim 1, the Examiner finds that APA logically partitions a virtualized computing cloud into virtualized logical server clouds, where each server cloud's local clock is synchronized to the virtualized computing cloud's centralized clock. Final Act. 2–3. Although the Examiner acknowledges that APA does not (1) implement selected first and second clock types into respective virtualized logical server clouds, and (2) disable the centralized clock as claimed, the Examiner cites Matson for teaching this feature. Final Act. 3–6. The Examiner also acknowledges that the APA/Matson system does not implement the first and second clock types in the respective server clouds simultaneously, but cites Zampetti for teaching this feature in concluding that the claim would have been obvious. Final Act. 6.

Appellant argues that not only does Matson's factory floor automation scheme fail to synchronize clocks in a cloud computing system, all hardware components in levels 0 to 2 of Matson's system are driven by the same Precision Time Protocol (PTP) clock that is synchronized to a centralized Network Time Protocol (NTP) clock. Appeal Br. 9–10; Reply Br. 2–4, 10. Although Appellant acknowledges that Matson uses different clock types for levels 0 to 2 and 3 to 5, respectively, Appellant nonetheless contends that each of these clock types is synchronized to a centralized NTP clock. Reply Br. 10–11. According to Appellant, Matson's centralized NTP clock is not

[4] Because the Examiner rejects the appealed claims cumulatively over six distinct sets of rejections (*see* Final Act. 2, 10, 18, 25, 32, 38), we address each set in turn beginning with the first set.

disabled such that any two components are synchronized to their own clocks as claimed. Appeal Br. 10; Reply Br. 7–8, 11–13. Appellant adds that the Examiner's reliance on Zampetti is likewise misplaced, for although Appellant acknowledges that Zampetti's various timing sources may be available at any given time, Zampetti does not use two different clocks for two different components simultaneously as claimed. Appeal Br. 11; Reply Br. 15–16.

ISSUE

Under § 103, has the Examiner erred in rejecting claim 1 by finding that APA, Matson, and Zampetti collectively would have taught or suggested (1) logically partitioning a virtualized computing cloud into virtualized logical server clouds, where each server cloud's local clock is synchronized to the virtualized computing cloud's centralized clock; (2) implementing selected first and second clock types into respective virtualized logical server clouds simultaneously; and (3) disabling the centralized clock in the server clouds such that the first and second server clouds are synchronized only to their respective clock types?

ANALYSIS

On this record, we agree with Appellant that the Examiner's rejection of claim 1 over APA, Matson, and Zampetti is problematic on this record. Although the Examiner's findings regarding APA (Final Act. 3) are undisputed, we nonetheless find the Examiner's reliance on Matson and Zampetti to cure APA's deficiencies with respect to (1) implementing selected first and second clock types into respective virtualized logical

server clouds *simultaneously*; and (2) disabling the centralized clock in the server clouds such that the first and second server clouds are synchronized *only* to their respective clock types is untenable on this record.

As shown in Matson's Figure 1, time is managed using NTP in levels 3 to 5, but between levels 3 and 2, NTP is converted to PTP to allow more accurate synchronization at the Cell/Area Zone level. Matson 4–5.[5] To this end, an embedded switch in a 1756-TIME Module shown in Matson's Figure 3 can be used. Matson 6–7.

The import of this discussion is that NTP is the standard timing protocol used not only exclusively in Matson's levels 3 to 5, but also as the basis for converting to PTP for use in lower levels. The NTP timing source is, therefore, effectively a centralized master clock to which other clocks are synchronized—including those that use PTP.

Although this functionality effectively implements two different clock types, namely NTP and PTP, respectively, we fail to see—nor has the Examiner shown—that the centralized clock in the APA/Matson system is disabled such that each respective virtualized logical server cloud is synchronized *only* to its respective clock type as claimed. If anything, Matson's centralized NTP clock remains active not only for use in levels 3 to 5, but also as a basis for conversion to PTP for use in lower levels. *Accord* Reply Br. 11 ("The plain teaching of Matson is to have a centralized clock running throughout the plant to which other clocks may be synchronized.").

[5] Although the Matson reference is unpaginated, we nonetheless refer to the reference's pages in the order that they appear in the record.

We reach this conclusion despite the user's ability to switch source clock types in the graphical user interface in Matson's Figure 4[6] as the Examiner indicates. *See* Ans. 27–34. Although switching from one type of source clock to another disables the former source clock, the respective server clouds in the APA/Matson/Zampetti system would still not be synchronized *only* to their respective clock types as claimed, for both clouds' clocks would still depend on the newly-selected centralized source clock. In other words, the centralized clock would still be enabled in this scenario, albeit a different centralized clock.

Therefore, we are persuaded that the Examiner erred in rejecting (1) independent claim 1; (2) independent claims 7 and 13 that recite commensurate limitations; and (3) dependent claims 6, 12, and 18–21 for similar reasons. Because this issue is dispositive regarding our reversing the Examiner's rejection of these claims, we need not address Appellant's other associated arguments.

THE OTHER OBVIOUSNESS REJECTION IN THE FIRST SET

Because the Examiner has not shown that the additional cited prior art cures the foregoing deficiencies regarding the rejection of independent claims 1, 7, and 13, we do not sustain the obviousness rejection of dependent claims 4, 5, 10, 11, 16, 17 over APA, Matson, Zampetti, and Sinha (Final Act. 7–9) for similar reasons.

[6] Although Matson does not label any figure as "Figure 4," we nonetheless refer to the first unlabeled figure on Matson's page 7 as "Figure 4" consistent with the Examiner's nomenclature. *Accord* Ans. 32 (noting that this unlabeled figure is the fourth figure in the Matson reference).

THE SECOND REJECTION OVER APA, MATSON, AND ZAMPETTI ("SECOND REJECTION SET")

For the reasons indicated previously regarding the Examiner's first rejection over APA, Matson, and Zampetti in connection with the first rejection set, we also do not sustain the Examiner's second rejection of claims 1, 6, 7, 12, 13, and 18–21 over APA, Matson, and Zampetti in connection with the second rejection set. *See* Final Act. 10–15.

THE OTHER OBVIOUSNESS REJECTIONS IN THE SECOND SET

Because the Examiner has not shown that the additional cited prior art cures the foregoing deficiencies regarding the rejection of independent claims 1, 7, and 13 in the second rejection set, we do not sustain the obviousness rejections of (1) dependent claims 4, 10, and 16 over APA, Matson, Zampetti, and Huang (Final Act. 15–16); and (2) claims 5, 11, and 17 over APA, Matson, Zampetti, and Muller (Final Act. 16–17) for similar reasons.

THE REJECTION OVER APA AND LAWSON ("THIRD SET")

Regarding independent claim 1, the Examiner finds that APA logically partitions a virtualized computing cloud into virtualized logical server clouds, where each server cloud's local clock is synchronized to the virtualized computing cloud's centralized clock. Final Act. 18–19. Although the Examiner acknowledges that APA does not (1) implement selected first and second clock types into respective virtualized logical server clouds simultaneously, and (2) disable the centralized clock as

claimed, the Examiner cites Lawson for teaching this feature in concluding that the claim would have been obvious. Final Act. 19–20.

Appellant argues the Examiner's reliance on Lawson is misplaced because Lawson's device clocks are synchronized to the same central cloud clock unlike the claimed invention where different clock types are not synchronized to a central clock, nor is Lawson's central clock disabled as in the claimed invention. Appeal Br. 17–19.

ISSUE

Under § 103, has the Examiner erred in rejecting claim 1 by finding that APA and Lawson collectively would have taught or suggested (1) logically partitioning a virtualized computing cloud into virtualized logical server clouds, where each server cloud's local clock is synchronized to the virtualized computing cloud's centralized clock; (2) implementing selected first and second clock types into respective virtualized logical server clouds simultaneously; and (3) disabling the centralized clock in the server clouds such that the first and second server clouds are synchronized only to their respective clock types?

ANALYSIS

On this record, we agree with Appellant that the Examiner's rejection of claim 1 over APA and Lawson is problematic on this record. Although the Examiner's findings regarding APA (Final Act. 18–19) are undisputed, we nonetheless find the Examiner's reliance on Lawson to cure APA's deficiencies with respect to (1) implementing selected first and second clock types into respective virtualized logical server clouds *simultaneously*; and

(2) disabling the centralized clock in the server clouds such that the first and second server clouds are synchronized *only* to their respective clock types is untenable on this record.

As Lawson's Abstract explains, an industrial device can synchronize its internal clock with a clock associated with a cloud platform. To this end, the cloud's clock can be designated as a master clock and the industrial controller's synchronization component 316 adjusts the controller's internal clock 320 to converge with the cloud's clock. *See* Lawson ¶ 54, 56; Fig. 3.

The import of this discussion is that the cloud clock is effectively a centralized master clock to which other clocks are synchronized. Even assuming, without deciding, that this functionality implements different clock types in paragraph 47 as the Examiner seems to suggest (*see* Final Act. 19–20), we fail to see—nor has the Examiner shown—that the centralized clock in the APA/Lawson system is disabled such that each respective virtualized logical server cloud is synchronized *only* to its respective clock type as claimed. If anything, Lawson's centralized clock remains active to synchronize other clocks. *Accord* Appeal Br. 18 (noting that all of Lawson's device clocks are synchronized to the same central cloud clock).

We reach this conclusion even assuming, without deciding, that clock types can be switched as the Examiner seems to suggest. *See* Final Act. 19–20. Although switching from one type of source clock to another disables the former source clock, the respective server clouds in the APA/Lawson system would still not be synchronized *only* to their respective clock types as claimed, for both clouds' clocks would still depend on the newly-selected centralized source clock. In other words, the centralized clock would still be enabled in this scenario, albeit a different centralized clock.

To the extent that the Examiner finds otherwise, we disagree. That the Examiner failed to respond to Appellant's arguments in this regard as Appellant indicates (Reply Br. 2) only further undermines the propriety of the Examiner's rejection.

Therefore, we are persuaded that the Examiner erred in rejecting (1) independent claim 1; (2) independent claims 7 and 13 that recite commensurate limitations; and (3) dependent claims 6, 12, and 18–21 for similar reasons. Because this issue is dispositive regarding our reversing the Examiner's rejection of these claims, we need not address Appellant's other associated arguments.

THE OTHER OBVIOUSNESS REJECTIONS IN THE THIRD SET

Because the Examiner has not shown that the additional cited prior art cures the foregoing deficiencies regarding the rejection of independent claims 1, 7, and 13 in the third rejection set, we do not sustain the obviousness rejections of (1) dependent claims 4, 10, and 16 over APA, Lawson, and Huang (Final Act. 22–23); and (2) claims 5, 11, and 17 over APA, Lawson, and Muller (Final Act. 23–24) for similar reasons.

THE REJECTION OVER APA AND CHAFFEE ("FOURTH SET")

Regarding independent claim 1, the Examiner finds that APA logically partitions a virtualized computing cloud into virtualized logical server clouds, where each server cloud's local clock is synchronized to the virtualized computing cloud's centralized clock. Final Act. 25–26. Although the Examiner acknowledges that APA does not (1) implement selected first and second clock types into respective virtualized logical

server clouds simultaneously, and (2) disable the centralized clock as claimed, the Examiner cites Chaffee for teaching this feature in concluding that the claim would have been obvious. Final Act. 26–27.

Appellant argues the Examiner's reliance on Chaffee is misplaced because (1) Chaffee's clocks are synchronized together with no centralized clock that is disabled as claimed, and (2) Chaffee's clocks do not use different time protocols simultaneously. Appeal Br. 21–23.

ISSUE

Under § 103, has the Examiner erred in rejecting claim 1 by finding that APA and Chaffee collectively would have taught or suggested (1) logically partitioning a virtualized computing cloud into virtualized logical server clouds, where each server cloud's local clock is synchronized to the virtualized computing cloud's centralized clock; (2) implementing selected first and second clock types into respective virtualized logical server clouds simultaneously; and (3) disabling the centralized clock in the server clouds such that the first and second server clouds are synchronized only to their respective clock types?

ANALYSIS

On this record, we agree with Appellant that the Examiner's rejection of claim 1 over APA and Chaffee is problematic on this record. Although the Examiner's findings regarding APA (Final Act. 25–26) are undisputed, we nonetheless find the Examiner's reliance on Chaffee to cure APA's deficiencies with respect to (1) implementing selected first and second clock types into respective virtualized logical server clouds *simultaneously*; and

(2) disabling the centralized clock in the server clouds such that the first and second server clouds are synchronized *only* to their respective clock types is untenable on this record.

As Chaffee's Abstract explains, a motion control system includes a clock synchronized with disparate clocks associated with disparate motion control components on a network. By synchronizing motion control component clocks 106 and 406 with other nodes, a common temporal understanding exists across the network. Chaffee ¶¶ 37, 61; Figs. 1, 4.

The import of this discussion is that the clocks are synchronized to each other to ensure a common temporal understanding across the network. Even assuming, without deciding, that this functionality implements different clock types in paragraph 37 as the Examiner seems to suggest (*see* Final Act. 26–27), we fail to see—nor has the Examiner shown—that the centralized clock in the APA/Chaffee system is disabled such that each respective virtualized logical server cloud is synchronized *only* to its respective clock type as claimed. To the extent there is a centralized clock in Chaffee, it remains active to synchronize other clocks. *Accord* Appeal Br. 22 (noting that there is no centralized clock that is disabled in Chaffee).

We reach this conclusion even assuming, without deciding, that clock types can be switched as the Examiner seems to suggest. *See* Final Act. 26–27. Although switching from one type of source clock to another disables the former source clock, the respective server clouds in the APA/Chaffee system would still not be synchronized *only* to their respective clock types as claimed, for both clouds' clocks would still depend on the newly-selected centralized source clock. In other words, the centralized clock would still be enabled in this scenario, albeit a different centralized clock.

To the extent that the Examiner finds otherwise, we disagree. That the Examiner failed to respond to Appellant's arguments in this regard as Appellant indicates (Reply Br. 2) only further undermines the propriety of the Examiner's rejection.

Therefore, we are persuaded that the Examiner erred in rejecting (1) independent claim 1; (2) independent claims 7 and 13 that recite commensurate limitations; and (3) dependent claims 6, 12, and 18–21 for similar reasons. Because this issue is dispositive regarding our reversing the Examiner's rejection of these claims, we need not address Appellant's other associated arguments.

THE OTHER OBVIOUSNESS REJECTIONS IN THE FOURTH SET

Because the Examiner has not shown that the additional cited prior art cures the foregoing deficiencies regarding the rejection of independent claims 1, 7, and 13 in the third rejection set, we do not sustain the obviousness rejections of (1) dependent claims 4, 10, and 16 over APA, Chaffee, and Huang (Final Act. 28–30); and (2) claims 5, 11, and 17 over APA, Chaffee, and Muller (Final Act. 30–31) for similar reasons.

THE REJECTION OVER APA AND CHEN ("FIFTH SET")

Regarding independent claim 1, the Examiner finds that APA logically partitions a virtualized computing cloud into virtualized logical server clouds, where each server cloud's local clock is synchronized to the virtualized computing cloud's centralized clock. Final Act. 32–33. Although the Examiner acknowledges that APA does not (1) implement selected first and second clock types into respective virtualized logical

server clouds simultaneously, and (2) disable the centralized clock as claimed, the Examiner cites Chen for teaching this feature in concluding that the claim would have been obvious. Final Act. 33–34.

Appellant argues the Examiner's reliance on Chen is misplaced because (1) Chen's clocks are synchronized together and to a centralized clock that is not disabled as claimed, and (2) Chen does not use different clock types simultaneously. Appeal Br. 25–28.

ISSUE

Under § 103, has the Examiner erred in rejecting claim 1 by finding that APA and Chen collectively would have taught or suggested (1) logically partitioning a virtualized computing cloud into virtualized logical server clouds, where each server cloud's local clock is synchronized to the virtualized computing cloud's centralized clock; (2) implementing selected first and second clock types into respective virtualized logical server clouds simultaneously; and (3) disabling the centralized clock in the server clouds such that the first and second server clouds are synchronized only to their respective clock types?

ANALYSIS

On this record, we agree with Appellant that the Examiner's rejection of claim 1 over APA and Chen is problematic on this record. Although the Examiner's findings regarding APA (Final Act. 32–33) are undisputed, we nonetheless find the Examiner's reliance on Chen to cure APA's deficiencies with respect to (1) implementing selected first and second clock types into respective virtualized logical server clouds *simultaneously*; and

(2) disabling the centralized clock in the server clouds such that the first and second server clouds are synchronized *only* to their respective clock types is untenable on this record.

Chen's system synchronizes digital content playback on different content players 110 by synchronizing a local time signal to a time reference signal on a time server 132. Chen Abstract ¶¶ 20–26; Fig. 1.

The import of this discussion is that the players' clocks are synchronized to a centralized clock on the time server. Even assuming, without deciding, that this functionality implements different clock types as the Examiner seems to suggest (*see* Final Act. 33–34), we fail to see—nor has the Examiner shown—that the centralized clock in the APA/Chen system is disabled such that each respective virtualized logical server cloud is synchronized *only* to its respective clock type as claimed. If anything, Chen's centralized clock remains active to synchronize other clocks. *Accord* Appeal Br. 26 (noting that Chen's clocks are synchronized to a centralized clock at time server 132).

We reach this conclusion even assuming, without deciding, that clock types can be switched as the Examiner seems to suggest. *See* Final Act. 33–34. Although switching from one type of source clock to another disables the former source clock, the respective server clouds in the APA/Chen system would still not be synchronized *only* to their respective clock types as claimed, for both clouds' clocks would still depend on the newly-selected centralized source clock. In other words, the centralized clock would still be enabled in this scenario, albeit a different centralized clock.

To the extent that the Examiner finds otherwise, we disagree. That the Examiner failed to respond to Appellant's arguments in this regard as

Appellant indicates (Reply Br. 2) only further undermines the propriety of the Examiner's rejection.

Therefore, we are persuaded that the Examiner erred in rejecting (1) independent claim 1; (2) independent claims 7 and 13 that recite commensurate limitations; and (3) dependent claims 6, 12, and 18–21 for similar reasons. Because this issue is dispositive regarding our reversing the Examiner's rejection of these claims, we need not address Appellant's other associated arguments.

THE OTHER OBVIOUSNESS REJECTIONS IN THE FIFTH SET

Because the Examiner has not shown that the additional cited prior art cures the foregoing deficiencies regarding the rejection of independent claims 1, 7, and 13 in the third rejection set, we do not sustain the obviousness rejections of (1) dependent claims 4, 10, and 16 over APA, Chen, and Huang (Final Act. 35–36); and (2) claims 5, 11, and 17 over APA, Chen, and Muller (Final Act. 36–37) for similar reasons.

THE REJECTION OVER APA AND FRELS ("SIXTH SET")

Regarding independent claim 1, the Examiner finds that APA logically partitions a virtualized computing cloud into virtualized logical server clouds, where each server cloud's local clock is synchronized to the virtualized computing cloud's centralized clock. Final Act. 38–39. Although the Examiner acknowledges that APA does not (1) implement selected first and second clock types into respective virtualized logical server clouds simultaneously, and (2) disable the centralized clock as

claimed, the Examiner cites Frels for teaching this feature in concluding that the claim would have been obvious. Final Act. 39–40.

Appellant argues the Examiner's reliance on Frels is misplaced because (1) Frels's clocks are synchronized to the same synchronization protocol, and not to a centralized clock that is not disabled as claimed, and (2) Frels does not use different clock types simultaneously. Appeal Br. 29–32.

ISSUE

Under § 103, has the Examiner erred in rejecting claim 1 by finding that APA and Frels collectively would have taught or suggested (1) logically partitioning a virtualized computing cloud into virtualized logical server clouds, where each server cloud's local clock is synchronized to the virtualized computing cloud's centralized clock; (2) implementing selected first and second clock types into respective virtualized logical server clouds simultaneously; and (3) disabling the centralized clock in the server clouds such that the first and second server clouds are synchronized only to their respective clock types?

ANALYSIS

On this record, we agree with Appellant that the Examiner's rejection of claim 1 over APA and Frels is problematic on this record. Although the Examiner's findings regarding APA (Final Act. 38–39) are undisputed, we nonetheless find the Examiner's reliance on Frels to cure APA's deficiencies with respect to (1) implementing selected first and second clock types into respective virtualized logical server clouds *simultaneously*; and (2) disabling

the centralized clock in the server clouds such that the first and second server clouds are synchronized *only* to their respective clock types is untenable on this record.

Frels's system synchronizes a clock via a backplane by comparing time information received from a clock via the backplane with time information received from a synchronization interface, where the latter time information is associated with an external clock. Frels Abstract; ¶¶ 6, 92, 114; Figs. 1A, 5. In one embodiment, backplane clocks can be synchronized between different devices. Frels ¶ 120; Fig. 6.

The import of this discussion is that device clocks are synchronized to an external centralized clock. Even assuming, without deciding, that this functionality implements different clock types in paragraphs 6 and 114 as the Examiner seems to suggest (*see* Final Act. 38–39), we fail to see—nor has the Examiner shown—that the centralized clock in the APA/Frels system is disabled such that each respective virtualized logical server cloud is synchronized *only* to its respective clock type as claimed. If anything, Frels's centralized clock remains active to synchronize other clocks. *Accord* Appeal Br. 26 (noting that there is no centralized clock that is disabled in Frels).

We reach this conclusion even assuming, without deciding, that clock types can be switched as the Examiner seems to suggest. *See* Final Act. 39–40. Although switching from one type of source clock to another disables the former source clock, the respective server clouds in the APA/Frels system would still not be synchronized *only* to their respective clock types as claimed, for both clouds' clocks would still depend on the newly-selected

centralized source clock. In other words, the centralized clock would still be enabled in this scenario, albeit a different centralized clock.

To the extent that the Examiner finds otherwise, we disagree. That the Examiner failed to respond to Appellant's arguments in this regard as Appellant indicates (Reply Br. 2) only further undermines the propriety of the Examiner's rejection.

Therefore, we are persuaded that the Examiner erred in rejecting (1) independent claim 1; (2) independent claims 7 and 13 that recite commensurate limitations; and (3) dependent claims 6, 12, and 18–21 for similar reasons. Because this issue is dispositive regarding our reversing the Examiner's rejection of these claims, we need not address Appellant's other associated arguments.

THE OTHER OBVIOUSNESS REJECTIONS IN THE SIXTH SET

Because the Examiner has not shown that the additional cited prior art cures the foregoing deficiencies regarding the rejection of independent claims 1, 7, and 13 in the third rejection set, we do not sustain the obviousness rejections of (1) dependent claims 4, 10, and 16 over APA, Frels, and Huang (Final Act. 41–42); and (2) claims 5, 11, and 17 over APA, Frels, and Muller (Final Act. 43–44) for similar reasons.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s) /Basis	Affirmed	Reversed
1, 6, 7, 12, 13, 18–21	103	APA, Matson, Zampetti		1, 6, 7, 12, 13, 18–21
4, 5, 10, 11, 16, 17	103	APA, Matson, Zampetti, Sinha		4, 5, 10, 11, 16, 17
4, 10, 16	103	APA, Matson, Zampetti, Huang		4, 10, 16
5, 11, 17	103	APA, Matson, Zampetti, Muller		5, 11, 17
1, 6, 7, 12, 13, 18–21	103	APA, Lawson		1, 6, 7, 12, 13, 18–21
4, 10, 16	103	APA, Lawson, Huang		4, 10, 16
5, 11, 17	103	APA, Lawson, Muller		5, 11, 17
1, 6, 7, 12, 13, 18–21	103	APA, Chaffee		1, 6, 7, 12, 13, 18–21
4, 10, 16	103	APA, Chaffee, Huang		4, 10, 16
5, 11, 17	103	APA, Chaffee, Muller		5, 11, 17

1, 6, 7, 12, 13, 18–21	103	APA, Chen		1, 6, 7, 12, 13, 18–21
4, 10, 16	103	APA, Chen, Huang		4, 10, 16
5, 11, 17	103	APA, Chen, Muller		5, 11, 17
1, 6, 7, 12, 13, 18–21	103	APA, Frels		1, 6, 7, 12, 13, 18–21
4, 10, 16	103	APA, Frels, Huang		4, 10, 16
5, 11, 17	103	APA, Frels, Muller		5, 11, 17
Overall Outcome				1, 4–7, 10–13, 16–21

REVERSED